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AN EXAMINATION OF RECENT DEVELOPMENTS
IN STUDENT HEALTH SERVICES IN BRITISH
UNIVERSITIES TOGETHER WITH SOME SUGGES-
TIONS FOR THE PROGRESSIVE DEVELOPMENT
OF HEALTH SERVICES IN AUSTRALIAN
UNIVERSITIES

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At the Conference of Directors of Physical Education in Universities held in Melbourne from August 13 to 15, 1947, I presented a paper on "Health Services for University Students" (1) which formed the basis for discussion on this subject at the conference. The paper included an analysis of the factors then contributing to the recognition of the problem in Australian universities, a brief account of developments in this field in Australian universities, an outline of some services in operation in British universities, and suggestions for the future development of health services in Australian universities. In the intervening period I have been engaged in collecting, by means of a questionnaire, detailed and comprehensive accounts of student health services from universities in the United States of America, Canada, Britain and Sweden. The material obtained from the questionnaire returns, together with information from reports, publications and personal correspondence with directors of student health services in some universities, has now been collated and a report (2) prepared. In addition to an analysis of the answers contained in the questionnaire returns, the report sets out in some detail the progressive development of student health services in Australian universities based on this analysis, and on the financial position of and on present facilities for student health services in Australian universities.

In this paper it is proposed to review recent developments in this field in British universities and to summarize the main short-term recommendations, as set out in the report mentioned above, for the future development of health services in Australian universities.

Health Services in American Universities and Colleges.

Before an examination is begun of recent developments in health services in British universities, a few comments on services in universities in the United States of America will indicate the extent to which health services have been established in the United States of America, and the range of services provided under modern student health-service programmes.

The first student health service in an American university developed as early as 1856, when Amherst College appointed a physician to examine students on entry. At the present time full student health services are generally provided in American universities and colleges.⁽⁵⁾

To show what has been achieved in these institutions I quote some figures from this report based on answers to a questionnaire returned in 1945-1946 from 300 colleges in the United States of America and in Canada, with a combined student enrolment of almost 1,000,000. It was considered that the colleges contributing to the survey showed a good representation of universities and colleges in the United States of America (same report). Of the 300 colleges, 284 provided health examinations of students (80 extended this facility to employees and 24 to the faculty; in all cases the examinations were compulsory for new students, in 138 cases compulsory also for second, third and fourth year students); 281 provided a health service office or dispensary; 37 provided complete and 163 limited hospital care; 274 provided physical education service programmes; 270 provided care of walking sick; 226 provided class-room courses in health education (these included courses in community hygiene, personal hygiene, mental hygiene, industrial hygiene, maternity and child

hygiene, nutritional hygiene, rural hygiene, school hygiene); and 73 gave an educational course on marriage. It is apparent from these figures and from a reading of the report referred to above that health examination and treatment services and physical education service programmes are well established in the majority of American universities, and that concern for the physical environment of students in these institutions is general. It is also evident that serious concern is being expressed both by university administrators and by student health service staff at the lack of adequate health education programmes, which are now regarded as an important element in the total student health-service programme. In May, 1947 (same report), the President of the Third Conference of Health in Colleges said in this connexion:

But, great as have been the achievements of the student health units in our colleges, there is still room for improvement. . . . I refer to the failure of the colleges to develop sound programmes in health education. It is curious that the student health service up to this time has been concerned almost exclusively with provision of medical care in the restricted meaning of the term.

These facts indicate that we would be well advised to study carefully what has been done in countries like the United States of America and Canada, learn from their mistakes and develop our own schemes accordingly, giving priority where the need is greatest and having due regard to the difference in university life here.

Recent Developments in Student Health Services in British Universities.

Australian universities are more likely, however, to be influenced by developments in British universities, on which for the most part they have modelled themselves. In a report from the University of Wales⁽¹⁾ the following statement is made:

Student health services have been introduced only recently at most Universities in this country. As might have been expected, there are numerous conceptions of the form which the service should take, and different Universities have laid emphasis on different aspects of the problem. Some have stressed the research aspect of their scheme, while others are more concerned with the immediate practical uses. Some have stressed the purely clinical aspect, while others are more interested in socio-economic problems. All the schemes are in an evolutionary stage, and the final form of the service at each University will be determined by experience and by adaptation to local conditions.

The first health service in a British university began at Edinburgh in 1929 with the establishment of a department of physical education and the appointment of one part-time female physician and two part-time male physicians, to carry out voluntary medical examinations of students. By 1939 only six out of 31 universities and university colleges in Wales and England had a compulsory medical examination on entrance, and four had a voluntary examination; by 1943 nine had compulsory and two voluntary examinations, while 19 others had developed medical services but never at all complete. At the present time all the Scottish universities have health services in operation, the University of Wales has commenced a health service in its constituent colleges (1948), and all the English universities and university colleges are operating health services at various stages of development.

There have been a number of major developments in recent years in student health services in British universities which have significant implications for, and should therefore be carefully and critically studied by, those interested in establishing student health services in Australian universities.

Physical Welfare of Students: A University Responsibility.

The first and most important of these is the general recognition and acceptance by university administrators of the principle that the physical welfare of students is their responsibility. This has been a slow process over the

past decade, which has come about almost unnoticed outside university circles in Great Britain. I think it can be claimed that the reports of various committees,⁽²⁾⁽³⁾ including those compiled by student groups,⁽⁴⁾⁽⁵⁾ have played an important part in bringing before university authorities in Britain the fact that health is one of the cardinal principles of education, and that one of the functions of a university concerned with the education of students should be to safeguard and promote their health. General recognition and acceptance of this principle by university authorities in Great Britain will inevitably influence the thinking of university administrators in Australia on this subject, and there is some evidence to suggest that the same slow process is beginning to gather momentum in Australian university circles.

Conferences on Student Health.

Another important development has been the convening of two conferences, in 1947 and in 1949, of medical officers engaged in student health services and others interested in the problem in Great Britain, by the Institute of Social Medicine, Oxford, under the auspices of the Nuffield Foundation. The first of these conferences, held on July 8 and 9, 1947, had before it several reports of pilot investigations of student health in two British universities (three Oxford colleges⁽⁶⁾ and Sheffield⁽⁷⁾), an account of the service in Edinburgh University,⁽⁸⁾ some information on the compulsory physical education activities for first-year students in the University of Birmingham,⁽⁹⁾ and an analysis of student health record cards. The resolutions of this conference (which should be closely studied by all those interested in the problem) have some bearing on the recommendations made in the final section of this paper and are set out in full below:⁽¹⁰⁾

1. That a memorandum embodying the main findings and the evidence reviewed at this Conference, and drawing attention again to the recommendations of the Goodenough Committee, the Social and Preventive Medicine Committee of the Royal College of Physicians, the memoranda of the principal student bodies (e.g. N.U.S. and B.M.S.A., etc.) and to the growing interest in this and many other countries in the problems connected with student health, be submitted to the Vice-Chancellors of all Universities in Great Britain and Northern Ireland; and that copies be sent also to the Principals of University Colleges, the Deans of the London Medical Schools and other constituent institutions of the University of London, and to the Ministries of Health, Education and National Insurance, the University Grants Commission, the Medical Research Council, the Nuffield Trust, the Carnegie Trust, the Royal Colleges of Physicians and Surgeons, the Association of University Teachers, the International Association of University Professors and Lecturers and the main student representative bodies in Great Britain.

2. That the following specific recommendations should accompany the memorandum:

- (a) That, regarding the student population as an important and distinct occupational group, a student health service with provisions for health advice and supervision, routine health examinations and chest radiography, has become desirable and should be made available for all university students.

- (b) That improved provisions for the care of the sick student, including hospital and sick-bay accommodation for short term cases, should also be made.

- (c) That, where such appointments are not already in being, the early appointment of at least one whole-time physician (where necessary with the whole or part-time assistance of other medical men) should be authorized in each university (other than London); his functions to include the organization of a student health service and the co-ordination of health and sickness and dental provisions, and a contribution towards the development of health education and physical education; and that, to facilitate his work, he should be provided with adequate accommodation and equipment and secretarial and nursing assistance.

- (d) That since the University of London, by reason of its size and dispersal over a large area, calls for separate consideration, the University, its Colleges and Schools, should take immediate action to implement this programme with such modifications as are required to meet special conditions.

3. That a sub-committee consisting of Professor Crew (Edinburgh), Dr. Macklin (Aberdeen), Dr. Bolton (Birmingham), Dr. Parnell (Oxford), Dr. Mann (Guy's Hospital), Dr. West (Bristol), Dr. Pemberton (Sheffield) and Mr. H. Cotton (Oxford) be appointed to consider the design of a standard record card for the entry of basic information of a factual kind for purposes of statistical analysis; and that the sub-committee be asked to consider the possibility of adopting or adapting the Fulheems system employed by the armed forces.

It will be noted that these recommendations are concerned with the appointment of full-time physicians to each of the universities, to organize and administer student health services, and, most important, to contribute towards the development of health and physical education programmes, with the need for health examinations, advice and supervision and for chest radiography, with the provision of facilities for the care and treatment of sick students and with the preparation of a standard student health-examination form.

While the matter of compulsory examinations of all students on entry was discussed and the benefits were summarized for the information of delegates, no pronouncement was made on whether health examinations should be made compulsory.

Evidence was provided from many of the universities represented of the small proportion of students who took some form of exercise regularly. Reasons advanced for this were similar to those which would be expressed if the question was raised in Australian universities—namely, lack of facilities, time required for travelling and lack of practical appreciation of its value.

It will be apparent, then, that at this first conference consideration was given to most of the facets of the full health service programme for students.

The second conference¹ of this body was held in Edinburgh on July 21 and 22, 1949, and because in the period since the last conference, the National Health Service Scheme had commenced to operate, main discussions centred round the relationship of student health services with the National Health Scheme. Other subjects discussed at this conference dealt with (a) the special requirements of women students, (b) the problem of mental stability in students (a report is to be prepared on this subject), (c) health-service records, (d) a study of nutrition among students at Edinburgh, and, most important of all, (e) problems arising from tuberculosis in the student population.

As well a comprehensive demonstration was given of the Edinburgh Student Health Service and its related agencies, including talks by the directors of the various component units in the service.

The resolutions of the conference, which show clearly the developments which had taken place in the thinking of those engaged in this work in England in the intervening years, are set out in full below:^(1a)

1. That the Conference recommends that, subject to the discretion of each university regarding its own conditions, treatment should be offered to students requiring it of their university health service. It is suggested that the treatment available should depend on the circumstances of the student—whether resident in hall, in lodgings, at home, or married—and should be in the form either of full National Health Service registration or of an industrial medical service.

2. That this Conference recommends that close contact should be maintained, through the appropriate channels, with the Ministry of Health and the Department of Health for Scotland, and the Central Committee representing general medical practitioners, to ensure the maximum assistance to all student health services consistent with the terms of the National Health Service Act and with the declared aim of avoiding conflict between student health service physicians and the general practitioners of the areas concerned.

¹ Unfortunately this report is available for private circulation only; the papers, and discussions on them, are not permitted to be reproduced in whole or in part. However, a copy is available from the Commonwealth National Fitness Office, Institute of Anatomy, Canberra.

3. That this Conference approves in principle the idea of a student sanatorium at which students from all parts of Great Britain can receive treatment for tuberculosis while at the same time continuing their studies as a form of occupational therapy, under the supervision of a university and subject to the discretion of the physician in charge of the sanatorium. It is recommended that the most suitable method of executing such a principle would be to transfer students at present in sanatoria throughout the country to a chosen sanatorium.

4. That the Conference recommends that a chest X-ray examination should be required of all students entering a university.

5. That the Conference recommends that non-resident universities should make adequate arrangements to provide a good mid-day meal at a reasonable price for all students who require it.

6. That prophylaxis in tuberculosis should be on an agreed pattern both in the nature of its provision and of its record-keeping; and that this pattern should be drawn up by a select body of experts and followed by all those who have the charge of student health, which is understood to include both nurses and medical students.

7. That the student health physicians be recommended to use a basically uniform record system to facilitate the exchange of statistical data.

That student health physicians be invited to transcribe data from their records (on the form in use in Oxford, Cambridge, Aberdeen, Glasgow and St. Mary's Hospital) to the extent of their resources, for collation and comparative analysis and the circulation of the results to all contributors.

8. That this Conference appoints Dr. R. H. Bolton, Birmingham, convenor of a sub-committee to consider the possibility of investigating the incidence of mental breakdown and tuberculosis among university students.

There are, it will be recognized, several important developments indicated in these resolutions.

The principle of compulsion has now been accepted, in part at least, by the acceptance of the recommendation that X-ray examination should be required of all entering students. Apparently the information made available to the conference by various delegates on this subject was sufficiently conclusive to bring about this change of front on a critical issue. This is further emphasized by the recommendation concerning the establishment of a student sanatorium (reference is made to this subject again later in this paper), and to the matter of prophylaxis in tuberculosis.

Some concern was expressed, when the relationship of the student health services with the National Health Scheme was discussed, as to how far the practice of students registering with the student health service doctor for examination and treatment would cut across the work of the general practitioner. This section of the conference report makes very interesting reading.

It will be noted that routine health examinations are now accepted, and the emphasis has passed to the development of treatment services under the terms of the National Health Service Scheme.

In the papers read to the conference there runs a constant reference to the need for concern to be shown to the social and environmental conditions in which students live and work. This concern expresses itself partly in Resolution 5 and also in the form which was recommended for the Standard Health Examination.¹

A significant omission from the resolutions was the matter of health education for students, which had been stressed at the first conference.

A Tuberculosis Sanatorium for Students.

Arising out of the statements on the incidence of tuberculosis in the student group in papers read before the Second Conference on Student Health, and on the basis of a survey of the incidence of tuberculosis carried out by a committee of the four principal student organizations in

¹ Copies of this form are available from the Commonwealth National Fitness Office.

1949, these organizations set up a Joint Committee in October, 1949, to consider the establishment of a student tuberculosis centre in Britain. The survey by the student group had indicated that there were likely to be 250 students who would benefit from treatment if such a centre could be established. In considering the proposal the Joint Committee pointed out that special sanatoria for the treatment of students suffering from tuberculosis, where they are able to continue their studies and even sit for examinations under medical supervision, are an accepted part of academic life in such European countries as France, Holland, Belgium, Switzerland and Czechoslovakia. For this particular age group study can be a valuable means of occupational therapy, as the student spends his time in the way he wants and is freed of the depressing feeling that he must waste months, perhaps years, before he can pick up his life again.

In January, 1950, with the support of the medical and academic world, the Joint Committee set out on its task of raising £50,000 to buy, convert and equip a suitable country mansion as a residential college and treatment centre.

The general aim is to equip the centre in the first instance with 100 beds. Here, students and members of colleges and university staffs will be able to go as soon as they are well enough to be out of bed for three or four hours every day, to continue their studies under medical supervision with proper tuition and the best possible library and laboratory facilities.

This is yet another instance of the student groups leading the way to university authorities in this field,¹ and in my opinion is a most significant development in student health services in British universities.

The Development of Treatment Services under the National Health Service Act.

The Goodenough Report² had suggested that there would still be need for student health services after the bringing down of the *National Health Service Act*. The provisions of the Act made it clear that student health schemes were outside its ambit, although it was evident that student health services could obtain assistance within the framework of the treatment services made available by the Act. Prior to the second Student Health Conference, several universities, notably those of Sheffield, Birmingham and Bristol, had made arrangements for their student health staff to be registered with the Local Medical Practice Committee. This procedure enabled students to register for treatment under the National Health Service with the student health service staff, and provided the university with the *per capita* payment made under the Act. It is understood that as a result of the conference referred to above, when the whole matter of the relationship of student health services to the National Health Service scheme was thoroughly discussed, other universities followed the example of those of Bristol, Sheffield and Birmingham in the registration of student health service staff and the provision of treatment services under the Act.

The general procedure in this connexion seems to be for the university to take over a ward at the local teaching hospital for the exclusive use of students and nurses, where they can receive the necessary treatment under the general supervision of the student health service staff. The Universities of Aberdeen, Edinburgh, Sheffield, Bristol and Leeds are known to be operating on this basis. At the same time it is evident that in some of the universities (Sheffield, Bristol, Birmingham) consideration is being given to the establishment of a small treatment centre of 20 to 30 beds within the university grounds where minor sickness can be treated, especially in patients who live at some distance from the university, and where patients not ill enough for admission to hospital can be kept under observation. Some

preliminary investigation is under way to see how far such a centre could be run as part of the National Health Service and so save cost to the university.³ University administrators and those interested in this problem in Australia should examine these developments closely.

There is no doubt that the bringing down of the *National Health Service Act* has given a considerable impetus to the development of treatment services within the framework of student health services and has relieved the universities of the problem, very real in other countries, of providing the necessary finances for the medical treatment of students.

An important side-effect of the recognition of student health services as coming within the National Health Service Scheme for treatment services has been the extension of the service to students' wives and families and to members of the university staff. The Universities of Bristol and Birmingham have been operating these broader services for the past two years, and Cambridge University has recently introduced health examinations for university staff for superannuation purposes. There is reason to believe, as more universities make provision for the registration of health service staff under the terms of the *National Health Service Act*, that the examination and treatment services will become generally available to students' wives and families and to members of the university staff.

Compulsory Examinations for Students.

While much discussion has taken place at the various conferences on student health on the question of compulsory examination, the principle of compulsory examination, even for chest radiography, is by no means generally accepted or applied. Among the larger English universities, those of Bristol and Birmingham have made the initial health examination and chest radiography compulsory for all students, and there is reason to believe that, following the last conference on student health at which a number of papers were presented on the subject of tuberculosis in students, more universities will be prepared to accept the principle of compulsion in this limited field, without, however, accepting its broader application to the health examinations. The procedure generally adopted, it would seem, is that students are notified on enrolment that they are expected to attend for examination, and if for any reason they do not wish to do so they are asked to explain their reasons to their dean or tutor.⁴ The universities of Sheffield, Belfast and Leeds, most of the London colleges (except the medical schools), and the universities of Wales, Aberdeen (except for medical students), Edinburgh, Oxford and Cambridge all follow and favour this method of approach as against the compulsory attendance at the general and X-ray examination.

It is significant, however, that in some of the British universities—and the number appears to be slowly growing—the principle of compulsion has been accepted in this field. If one can judge present trends, it would appear that the principle will be more widely accepted and applied as the results of examinations, particularly chest X-ray examinations, become available.

Compulsory Participation in Physical Education Activities.

Another interesting development which should be studied carefully by those considering the establishment of student health services in Australian universities is the compulsory programme of physical education for all first-year students commenced in the University of Birmingham in 1946, and lately adopted by Hull University College. While voluntary participation in organized classes has been generally accepted and provided for by special staff appointed by the universities, those of Birmingham and Hull are the first British universities to make it obligatory for first-year students to participate in an organized programme of physical education.

¹ A report by the Students' Representative Committee of Sheffield University, presented through their vice-chancellor to the Vice-Chancellors' Committee in 1936, gave rise to recommendations which subsequently led to the development of limited student health services in Sheffield and other British universities.

² In this connexion it is interesting to note that Hull University College established a centre with a resident nurse in 1948, for men students. It has now been extended to include women students.

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These, then, are in my opinion the most significant developments which have taken place in student health services in British universities in the last few years. All of them have important implications for the development of student health services in Australian universities and should be examined thoroughly and critically by those interested in this field in Australian universities.

Stages of Development of Health Services in British Universities.

Analysis of these and earlier developments would seem to suggest that there are several definite stages through which such services pass before they can be regarded as providing what is now considered as the full range of student health services.

These stages may be set out as follows.

The Recognition of Responsibility by University Authorities.

The principle of recognition by university authorities of their responsibility for the physical welfare of students is now accepted without question by all universities in Great Britain. Those of us in Australia interested in this field can take heart from the fact that approximately fifteen years elapsed before this principle was generally recognized and applied from the time when it was first strongly canvassed in university circles.

The Provision of Facilities for Health Examinations.

The provision of facilities for health examinations, including chest X-ray examination, of all entering students, and the appointment of full-time medical officers are the second stage. While in the past the emphasis has been on voluntary participation in the examinations, present trends would seem to indicate that the principle of compulsory examinations, particularly for chest radiography, is now becoming more generally accepted.

In this connexion it should be noted that, with few exceptions (the universities of Durham and Manchester are two notable ones), British universities have appointed full-time physicians to operate and maintain these services. Edinburgh University, as far as I am aware, is the only university where the principle of appointment of part-time physicians is still held and applied.

The usual basis of appointment of full-time physicians to the staff is one to about 800 students.⁽¹⁵⁾ There is some variation here according to whether treatment is undertaken, which involves more physicians but often part-time men.

The Provision of Consultative Services in Addition to the Health Examinations.

The practice in Great Britain in the early stages of the student health service development was for the examinations to be concerned with medical matters only. However, with the appointment of full-time staff it was possible to extend the scope of the examination to include consideration of social and economic factors which might be regarded as having some bearing on a student's health. Consideration of these factors led inevitably to the giving of advice to the student on general health matters, such as nutrition, participation in physical activities, and so on. The examinations became then in fact health examinations and were regarded by the physician as providing an opportunity to talk to the student on his health problems. In this way the student was encouraged to return to the physician to discuss these problems, and it was possible for a good deal of individual health education to be carried out. Medical circles in Great Britain appear to regard the consultation as probably the best method of developing a health education programme for students.

The Provision of Treatment Services.

It is now possible in Great Britain under the *National Health Service Act* for student health service staff to be registered by local medical boards, and for students

registering with the staff to obtain without cost full treatment services. The usual practice is for a ward at the local teaching hospital to be made available exclusively for the treatment of students and nurses under the supervision of the National Health Service staff (universities of Aberdeen, Edinburgh, Sheffield, Bristol, Leeds). A recent development in this connexion has been the establishment of a small treatment centre in the grounds of Hull University College, and moves have been made in Bristol and Birmingham to establish similar facilities in their universities, where students not ill enough for admission to hospital can be kept under observation.

The Supervision of the Physical Environment of Students.

It is now generally recognized that the conditions under which students live and work play a very important part in their general health and well-being. For this reason, concurrently with the development of health examination services, there have developed in some British universities services for the supervision of student lodgings, and increasing concern is being shown for the food services provided to students by the university.⁽¹⁶⁾ Universities like those of Oxford, Cambridge and Edinburgh have appointed housing officers whose functions include inspection of lodging houses and general supervision of students living in lodgings.

The strong interest in and concern for the physical environment of students as part of the student health service programme characteristic of American universities is still not general in British universities. It is thought, however, that as other stages of the service become well established, increasing concern will be shown for this important aspect of the student health service programme.

Physical and Health Education Programmes.

Physical education and health education are two aspects of the health service programme which it is somewhat difficult to fit into the stages previously indicated.

Physical education services had developed in many universities (Leeds, Birmingham, Manchester, Bristol, Hull) before the advent of other aspects of the health service programme, but then only on the basis of voluntary participation by students. Concomitantly with the first stage described, and developing out of the results of the health examinations and discussions on these at the conferences mentioned previously, increased emphasis has been placed on the conduct of a service programme in physical education, although only two universities (Birmingham and Hull) had considered it necessary to develop a compulsory programme of physical education for all first-year students. The procedure in the majority of universities would now seem to be that sports and games are organized and conducted by student groups, these activities being supplemented on a voluntary basis by the work of the physical education staff.

The first Conference of Directors of Physical Education in British Universities held in Manchester on April 11 to 13, 1949,⁽¹⁷⁾ discussed the question of compulsory participation in physical education activities, but did not bring forward a resolution indicating the general attitude of the members on this subject.

Health education is still not included within the framework of student health services in British universities, despite the strong advocacy of such a move in the report of the student bodies⁽¹⁸⁾ and in the report of one of the pilot investigations.⁽¹⁹⁾ However, with the extension of the examinations to include consideration of social and economic factors affecting student health, and with the appointment of full-time medical officers, some attempt has been made to give students health advice arising out of the examinations and the subsequent consultations. It seems that developing out of the needs of students as expressed through consultations during and following examinations there will come in British universities some health education courses. Present trends would seem to indicate that these will be provided on a voluntary basis.

Proposals for Future Development of Student Health Services in Australian Universities.

In the report⁽¹⁾ to which reference has been previously made, there is to be found a detailed account of the progressive development of student health services in Australian universities over the next twenty years. It is proposed in this paper to deal only with those aspects of development which universities might consider in their plans for the next five years.

Compulsory Annual Chest X-ray Examinations for All Students.

While the majority of Australian universities (Melbourne, Sydney, Western Australia, South Australia) have made arrangements, with the exception of South Australia through the Students' Representative Council, for voluntary chest X-ray examination, no Australian university has yet been prepared to adopt the principle of compulsory chest X-ray examinations.¹ A number of factors may influence the future attitude of university administrators towards this question. These are: (i) the results of chest X-ray examinations of British students; (ii) the attitude of students' representative councils to compulsory examinations; (iii) the bringing down of legislation by State governments making radiological examinations compulsory;² (iv) the provision of compulsory chest X-ray examinations for all students awarded Commonwealth scholarships. The last-mentioned factor is particularly important in view of the fact that, as a result of chest X-ray examinations of these students, it may be possible to get some indication of the incidence of tuberculosis, not only in entering students, but also in students at various stages of their academic careers in Australian universities.

Whatever facts emerge from these examinations, it does seem that university authorities in Australia should give serious and immediate consideration to the development of compulsory chest X-ray services for all students. The problem to be faced here is not one of finance, of universities providing services and facilities for the chest X-ray examination, since State governments, under agreement with the Commonwealth, have established chest X-ray clinics³ where any person may obtain free examinations; it is rather the problem of having university administrators accept the principle of compulsory examinations.

It is evident that it will not be possible to obtain representative figures for the incidence of tuberculosis in Australian university students until such time as all students can be examined. This, then, is regarded as the first move towards the establishment of student health services in Australian universities—the compulsory annual chest X-ray examination of all students in Australian universities.

Once this principle has been accepted and an initial examination of all students has been made, it will be a relatively simple matter for the examinations to be carried out on an annual basis. Because of the special conditions under which medical students work in their clinical years, provision should be made for them to be radiologically examined at intervals of six months.

Mantoux Skin Testing and B.C.G. Vaccination.—The development of Mantoux skin testing and B.C.G. vaccination is dependent, I believe, except possibly in the case of medical and dental students, on the appointment of medical officers to administer and conduct a student health service. For this reason it may well represent the second stage in

¹ The University of Adelaide has now made a health examination, including a chest X-ray examination, compulsory for all first-year students.

² The Health Act in Western Australia has recently been amended to make radiological examinations compulsory for all persons over the age of fourteen years; the Tasmanian *Tuberculosis Act*, 1949, makes similar provision.

³ The School of Public Health and Tropical Medicine in the University of Sydney and the Commonwealth X-ray and Radium Laboratory in the University of Melbourne have facilities for chest X-ray examination which could be made available without cost to all students.

the development of health services in Australian universities. It is considered advisable that all students on entry should be given a Mantoux skin test, and if they fail to react provision should be made for them to have B.C.G. vaccination. It is among this group of non-reactors that tuberculosis morbidity will be heaviest, and therefore the provision of B.C.G. vaccination, which has now passed the experimental stage, is considered necessary. Successful vaccination, it is understood, will in a matter of weeks bring about conversion of the Mantoux test result in a high percentage of those vaccinated. Moreover, it is stated that successful vaccination will considerably diminish the immediate dangers of the primary infection. All non-reactors should continue to be tested at intervals of six months until such time as conversion occurs, when they may enter into the general scheme of chest radiography. If these measures were undertaken, it is held that university authorities would obtain a clear picture of the magnitude of the task which would have to be faced in the treatment of students suffering from tuberculosis (it might be necessary then for steps along the lines of those being followed by the student groups in Great Britain to be adopted in Australia), and would lay the basis for a preventive health service for their students.

The Appointment of Full-time Medical Officers and Nurse-Secretaries, and the Provision of Facilities for Health Examinations of All First-year Students.

The functions of such officers and the basic facilities to be provided to enable the health examinations to be made are set out fully in the report⁽²⁾ previously referred to.

It is realized, of course, that with the present shortage of medical officers in Australia, and with the serious gaps which exist in country, school and industrial medical services in Australia, it will be difficult to find medical officers for student health services. For this reason it is considered that in the early stages in the larger universities (Melbourne and Sydney) a full-time male officer and a part-time female officer, and in the other universities part-time male and female officers, might be appointed. It should, of course, be a much easier proposition to obtain the services of part-time officers. However, in my opinion, this should be regarded as only an interim measure until such time as sufficient full-time officers can be appointed adequately to carry out the service. The ratio of medical officers to students for this service is a matter on which at this stage it would be as well not to pass judgement. Certain standards in this connexion with a voluntary examination service have been adopted in some of the British universities (one doctor to 800 students appears to be the usual standard); but much more evidence on this point will come forward from Great Britain in the next two or three years, and, together with the experience arising out of the skeleton services just suggested for Australian universities, should provide a sound basis on which to suggest standards for Australian universities.

The task of meeting the cost of establishing such a service in the present financial state of Australian universities is, however, probably the biggest hurdle to be overcome. Raising the fees of students to cover the cost of the service is a step which most universities would be extremely loath to take, and meeting the cost from present financial resources is quite out of the question.

However, with the establishment of the Commonwealth Scholarship Scheme and the acceptance of the principle by the Commonwealth that all scholarship holders must undergo medical examination (including chest X-ray examination) at the expense of the Commonwealth, it would appear as if some financial support might be provided to the universities to make possible the appointment of full-time officers (in the larger universities) and part-time officers (in the smaller universities) to carry out examination of these students, of all first-year students, and of such other groups of students as the university authorities may from time to time determine.

It seems reasonable that the university, under this scheme, might be reimbursed for the cost of the examinations of all entering scholarship holders, which in the

Universities of Sydney and Melbourne would probably be sufficient to cover the salaries of the full-time officer and several part-time officers, and in the other universities the salaries of the part-time officers. On this basis the university would be required to find only the necessary finances for the establishment, equipment and maintenance of the small centre for examinations. This should not present an insuperable problem even under existing financial and accommodation conditions. At this stage such facilities would need to include the following: (a) several examination rooms; (b) at least two dressing rooms; (c) a waiting room; (d) small laboratory; (e) offices for medical officers and nurse-secretary.¹

Development of these services over the next five years would provide detailed information of the extent and nature of ill-health in the student population, an analysis of which would then indicate desirable lines of future development in this field.

The Commencement of a Service Programme in Physical Education.

The University of Queensland is the only Australian university to have given any serious consideration to the development of a service programme in physical education. In this university participation in physical education has been compulsory for all first-year medical students, except ex-servicemen, for the past nine years, the Faculty of Arts has accepted the principle of compulsory participation for all first-year Arts students, and participation is required of all students undertaking the post-graduate education courses, and the Bachelor of Science course in physiotherapy. The main problem in this university is, in the opinion of the director of the course, lack of staff. In other Australian universities it would probably be, at this stage, lack of suitable indoor and outdoor facilities. However, since the provision of facilities at the new university at St. Lucia, including three gymnasiums with change and shower rooms, the University of Queensland is reasonably well served in so far as facilities are concerned. With the development of plans to erect a physical education building, which it is understood is to include a tepid swimming pool, this university will have the best plant and facilities of any Australian university. Provision of these additional facilities will make possible the steady development of a complete service programme in physical education for general students in this university.

The University of Tasmania, at the new university at Sandy Bay, is the only other Australian university to incorporate a physical education building in its scheme for future development. Because of the serious lack of indoor accommodation for physical education in most Australian universities, and the difficulty, in view of the claims by other departments for extensions and the shortages of materials and manpower, of having suitable accommodation erected within a reasonable period, development of this aspect of the health-service programme in most Australian universities in the next five years will necessarily be a slow process.

Departments of physical education within the universities should, however, within the limits of their accommodation and staff, be carrying out a programme which will have as one of its objectives the acceptance by university authorities of the principle that participation in a physical education programme is an important part of the student health service which all universities should be providing for their students. To assist in developing this programme it is suggested that two extra staff members (one male and one female) should be appointed to the physical education departments in the Universities of Melbourne, Queensland, Adelaide, Sydney, and possibly also Western Australia. Such staff members would probably have the status of lecturers and would be responsible for the following: (a)

the conduct of special recreational classes for those students referred to them by the medical officers; (b) the conduct of corrective classes for students referred by the medical officers and under their supervision; (c) active liaison with the sports union, so that classes in the fundamentals of games skills could be provided; (d) the organization, in association with the relevant student associations, of camps, hikes and other activities of a like nature, such as mountaineering, canoeing, *et cetera*; (e) the conduct of special recreational classes for staff members of the university. In addition to these duties it is considered that such officers should concern themselves with conducting, on a voluntary basis initially, classes for first-year medical and physiotherapy students and for those students undertaking the various education courses. Students in these faculties, it is held, should eventually, when adequate indoor facilities become available, be required to participate in physical education activities from the point of view of their professional training as much as from the personal benefit which they will derive from these activities.

Until such time as adequate indoor facilities can be provided, it is considered that this is the extent to which this particular aspect of the health service programme can be developed.

Appointment of a Dietitian and a Social Worker to the Student Health Service Staff.

It is now generally accepted in British universities—and this was strongly emphasized in the Edinburgh report²—that more concern should be shown for the provision of nutritious meals at the university. This has been specially stressed in those universities where the majority of students are forced to live in lodgings. It is worth recording also that the writers of the Edinburgh report were very concerned with the fact that "in Edinburgh University today a meal is a physiological action; it is rarely a social occasion. . . . We simply record that food no longer serves as a background for that essential function of a university—the exchange of ideas".

It is considered that much the same criticisms could be advanced on both scores to the refectory services provided in Australian universities. The appointment of a dietitian as a member of the student health staff, to supervise generally the meals served at refectories, would it is thought go a long way towards solving the first of these problems. There would, of course, at first be some difficulties in those universities where the services are let out on contract to outside firms of caterers. Concomitantly with the supervision of meals the dietitian should concern herself with the education of the student body in food values. The Edinburgh report makes an interesting comment on this point:

From our interviews with students we would consider that a lack of elementary knowledge of human physiology was more important than a lack of money in determining bad feeding. Even at University level there is a real need for elementary health education.

The education in nutrition would form part of the general health education programme which would be offered to all students both during orientation week and throughout the academic year. Again, of course, special health education courses, including reference to nutrition, could be offered to groups of students such as those taking education, medicine, social science, who by the special place they will occupy in the community on graduation can and must play a vital part in raising general community standards in nutrition and health.

The second problem can be tackled only on a long-term basis and must necessarily involve the establishment of more and better designed and equipped refectory facilities in our universities so that the full social values of the refectory can be thoroughly realized.

Some Australian universities, notably those of Melbourne and Sydney, because of the very serious problem which faced them in the post-war years of seeing that students obtained reasonable accommodation, have appointed housing

¹ Such facilities have already been developed in the University of Adelaide, where a voluntary health examination service has been in operation for the past three years, by the Health Services Committee set up by the university and financed in the main by an annual union grant of £500.

officers, whose main function it is to see that students are provided with satisfactory accommodation. Because of the magnitude of the problem these officers have been able to devote little if any of their time to the inspection of such accommodation. The University of Queensland is still the only Australian university to have included regulations in university statutes which require all lodging houses to be licensed by the university, to provide that a student must notify the Registrar of his intention to reside at a particular boarding house, and to give the Registrar or any other person appointed by the Senate power to inspect such lodging houses.¹⁶ While under present circumstances in the larger centres like Sydney and Melbourne it may be extremely difficult for such regulations to be carried out, it does seem desirable for other university authorities to give serious consideration to steps which will enable them to exercise supervision over the type of accommodation provided to students. To this end it is suggested, therefore, that a social worker should be appointed to the health service staff, one of whose duties would be to carry out regular inspections of lodgings, and on this basis to draw up a list of suitable accommodation available to students. Such an officer also could be responsible for visiting sick students in lodgings, and generally, acting under the supervision of the medical officer, to follow up students who as a result of consultations with the medical officer were found to be ill but not seriously enough to be admitted to hospital.

In Australian universities, where the great majority of students do not live in colleges, supervision of lodgings should be considered an important aspect of the work of the student health service.

Development of Consultative and Treatment Services.

One of the functions of the full-time medical officers in the larger universities would be to provide a consultative service, which would be available to students at certain times throughout the academic year. A similar service could probably be provided in the smaller universities by using the services of the part-time officers on a roster basis. In the initial stages this service might well be provided on a voluntary basis, as is done, for example, by the Health Services Committee of the University of Adelaide on each Monday morning. Some indication of the use to which Australian students are likely to put such a service would then develop out of this project. Experience in the University of Toronto, Canada, suggested that students made use of a consultative service on an average of 1.25 consultations per student each academic year.¹⁷ Extension of this service to provide compulsory consultations at regular intervals (say every six months) would, of course, require the appointment of additional staff, which would have to be provided at a later stage of development in the service.

The development of treatment services as part of student health services in Australian universities will be a long and slow process. It is envisaged that, pending the establishment of full departments of student health in Australian universities, the medical officers will be attached to the Faculty of Medicine and will be members of the professorial unit of one of the teaching hospitals, preferably that closest to the university. With this liaison with the teaching hospital it may be possible for those students who desire treatment by the university medical officer to be provided with a bed in a public ward of this hospital and to be given free treatment under the general supervision of the medical officer. In the early stages of the service the medical officer will have little time to devote to this service, although in all the reports on health services in British universities the desirability of having the medical officer interest himself in the treatment of some of the students is strongly stressed. Extension of this service will probably be dependent on the following: (a) the appointment of more staff to the service, both full-time and part-time; (b) the attitude of the general practitioner to the medical officers accepting this responsibility; (c) the attitude of students towards the provision of such a service.

Such a project, even in a limited form, should provide valuable information as to the extent to which students are likely to use a treatment service of this nature, and would test the reaction of general practitioners to the service. In some of the universities it may be possible even in this period for a small treatment centre of five to ten beds under the supervision of a nurse to be established for the treatment of students living in lodgings and not ill enough to be admitted to hospital. The experience of staff as to the incidence of such cases will be the best guide as to when such a centre is to be established and its size.

Conclusion.

These, then, are in my opinion the major lines of development which student health services in Australian universities must look to pass along in the next five years.

At this stage, when only partial schemes are in operation in several universities, it would seem desirable for a small committee, representative of the Universities Commission of the Commonwealth Office of Education, the Commonwealth Department of Health, the National Union of Australian University Students, and the Vice-Chancellors' Conference, to be established to make a thorough investigation of the services already operating in Australian universities, and to plan, in the light of these developments and of the recent developments in this field in British universities, and within the framework of possible national health services, a scheme which will make possible the progressive development of student health services in Australian universities.

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FURTHER REVISION OF THE DERMATOMES.

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In a previous paper on this subject (Young, 1949) a chart was published showing what I believed to be the cutaneous distribution of the pain fibres of the posterior nerve roots in man. This chart was based upon a study of the distribution of sensory changes in patients suffering from root pain and upon the distribution of the rash in

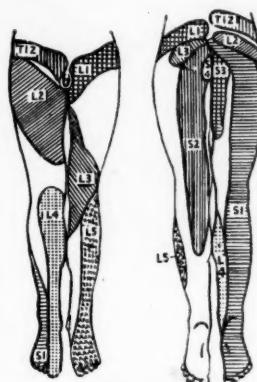


FIGURE I.
The lumbar and sacral dermatomes as previously published (Young, 1949).

patients suffering from *herpes zoster*. It was not claimed that the chart was accurate, but it was suggested that further cases of *herpes zoster* affecting the seventh and eighth cervical and the third, fourth and fifth lumbar

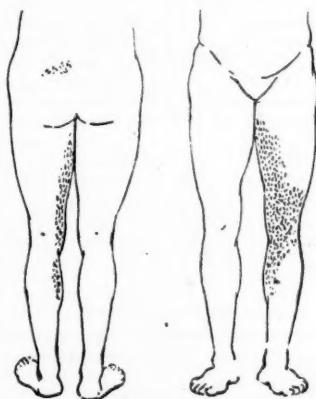


FIGURE II.
From McKenzie's case of *herpes zoster*. Apparently used by Head and Campbell in drawing their third lumbar dermatome, but probably *herpes* of the second sacral segment and perhaps part of another segment.

dermatomes should be studied in order to determine more accurately the distribution of these dermatomes.

Figure I shows the lumbar and sacral dermatomes as previously published. The third lumbar dermatome was

then given the same distribution as Head and Campbell (1900) had given to it, and no comment was made about its distribution, as then I had little factual evidence upon which to make any alteration; but further experience has now made it possible to correct it.

The distribution of the second lumbar dermatome as shown in Figure I is, I think, substantially correct. This area is immediately below the segment of skin which, from anatomical considerations, we know is innervated by the first lumbar nerve. Head (1893) published a report of a case of *herpes zoster* affecting this area, several others have been published, and I have observed three. In all these cases the area of skin affected has been reasonably constant.

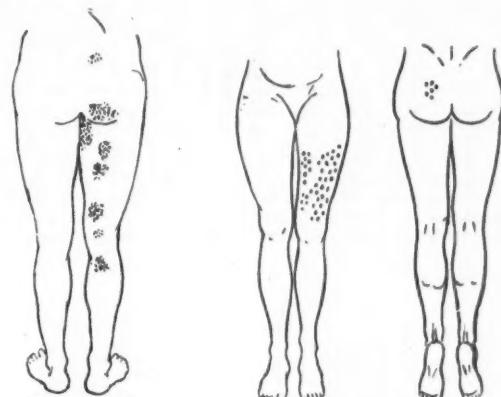


FIGURE III.
McKenzie's case of *herpes zoster* of the second sacral segment.

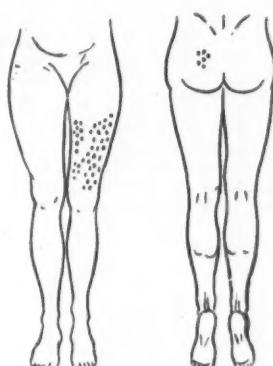


FIGURE IV.
Herpes zoster of the third lumbar segment. Dr. Cyril Fortune's case.

In Figure I it will be seen that the lower part of the antero-lateral aspect of the thigh is not innervated by any spinal nerve. Obviously this is incorrect. We know that this area is innervated only by the lateral cutaneous nerve

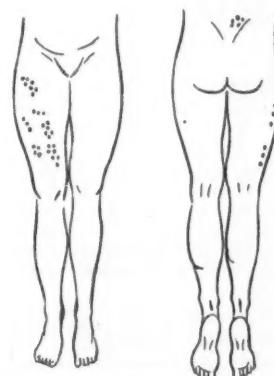


FIGURE V.
Herpes zoster of the third lumbar segment. (My own case.)

of the thigh, which arises from the second and third lumbar nerves. We also know that it is not part of the second lumbar dermatome. The lower part of the antero-lateral aspect of the thigh must therefore be innervated by the third lumbar nerve.

Head and Campbell (1900) apparently based the distribution of their third lumbar dermatome upon a case of

herpes zoster (Figure II) published by McKenzie (1893), but there was no actual proof that this involved the third lumbar segment. The distribution of the rash was in fact not greatly different from that of another case (Figure III) also published by McKenzie (1893), and previously considered (Young, 1949) to be a case of *herpes zoster* of the second sacral segment.

It seems to me that Figure II represents a case of *herpes zoster* involving the second sacral and perhaps part of another segment. If this is so, then it is not wise to draw conclusions from this case.

Figure IV is from a case of *herpes zoster* referred to me by Dr. Cyril Fortune, and Figure V is from one of my own cases. In both the lower part of the antero-lateral aspect of the thigh is involved, and the area affected is lower than but slightly overlapping the second lumbar dermatome. These must therefore be cases of *herpes zoster* affecting the third lumbar dermatome. In both it will be noted that there is a small area of rash near the sacrum, just above it in one and just lateral to it in the other, and that there is a large gap of unaffected skin between the rash near the sacrum and the rash on the thigh.

Figure VI is from another case of *herpes zoster* seen by me. In this case that part of the rash marked by circles appeared four days later than that part marked by crosses. It seems certain that this is a case of *herpes zoster* affecting both the second and third lumbar segments.

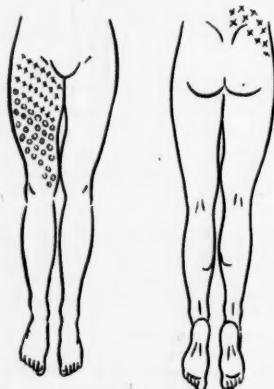


FIGURE VI.
Herpes zoster of the second (crosses) and third (circles) lumbar segments. (My own case.)

The distribution of the third lumbar dermatome as defined by these three cases of *herpes zoster* agrees closely with the distribution of the sensory changes in patients with third lumbar root pain. In such patients sensory changes are found in the antero-lateral aspect of the thigh and in the upper half of the antero-medial aspect of the leg (Young, 1949).

I have seen no cases of *herpes zoster* affecting the fourth lumbar dermatome since writing my previous article.

The fifth lumbar dermatome in Figure I was based entirely upon the distribution of sensory changes in patients with root pain. Since this figure was drawn Guthaner (1948) has recorded a case of *herpes zoster* affecting the fifth lumbar dermatome, and has informed me (personal communication) that the area affected was that shown in Figure I, and in addition the outer aspect of the knee and the outer aspect of the lower third of the thigh.

It has previously been pointed out (Young, 1949) that there are touch dermatomes, pain dermatomes and vaso-dilator (*herpes*) dermatomes, and that the vaso-dilator dermatomes appear to correspond fairly closely to the pain dermatomes.

Figure VII is a revised chart of the cutaneous distribution of the pain fibres of the posterior nerve roots in man. Again it is not suggested that this chart is final, but I think it will be found to be substantially correct. It will be noted that the lumbar and sacral dermatomes now succeed one another in logical and numerical sequence and in a manner which is embryologically and anatomically feasible. The first and second lumbar dermatomes proceed all the way from the mid-line to the periphery. The third lumbar dermatome has a part next to the mid-line inner-

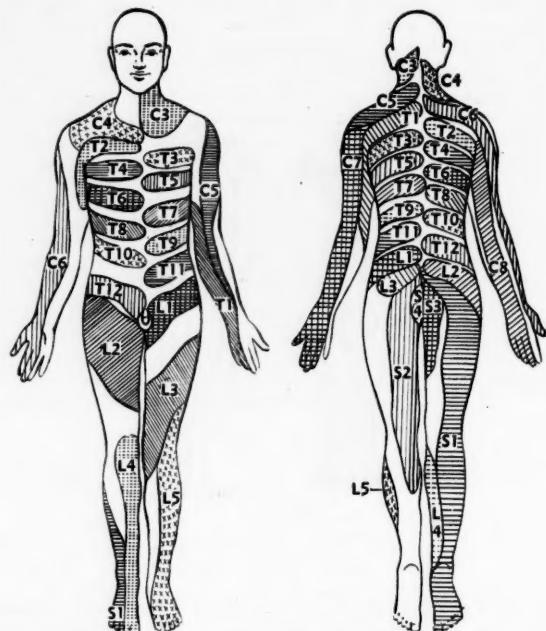


FIGURE VII.
Revised chart of the pain dermatomes in man.

vated by the posterior primary ramus of the third lumbar nerve and separated by a gap from its peripheral part. The fourth and fifth lumbar nerves have no posterior primary rami and their dermatomes are only peripheral. The sacral dermatomes, like the first and second lumbar dermatomes, proceed all the way from the mid-line to the periphery. The separation of the third, fourth and fifth lumbar dermatomes from the mid-line corresponds with the drawing out of the limb bud during development.

Further work still needs to be done, and in particular cases of *herpes zoster* affecting the seventh and eighth cervical and the fourth and fifth lumbar dermatomes should be published.

Acknowledgement.

I am indebted to Dr. Cyril Fortune, who referred to me the case of *herpes zoster* illustrated in Figure IV.

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SOME OBSERVATIONS ON THE TREATMENT OF OTITIS EXTERNA AND OTITIS MEDIA.

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OTITIS EXTERNA.

OTITIS EXTERNA is usually considered to be an inflammation of the external auditory meatus with or without involvement of an intact tympanic membrane.

As the meatus and tympanic membrane are covered with a layer of epidermis, the problem of treating *otitis externa* resolves itself into one of skin therapy within a partially enclosed space and involving a special structure.

Classification.

An attempt has been made to classify the different types of *otitis externa* as follows: (i) acute simple inflammation, (ii) acute allergic inflammation, (iii) chronic allergic inflammation. All categories have subdivisions.

The three types of acute simple inflammation are: (a) furunculosis, (b) cellulitis, and (c) simple frank bacterial infections of the whole meatus and tympanic membrane, with a discharge from which a pathogen or a predominant microorganism can be cultivated. In all cases in this group the history is of short duration.

Acute allergic inflammation is, of course, caused by drugs and antibiotics, and in this group also the history is of short duration. As is well known, the commonest drug allergy is that due to iodine, and the commonest antibiotic reaction is that due to the use of penicillin and sulphonamides. Solutions of sulphonamides, as used in this series, produced allergic reactions in only a few cases. No case occurred which could be classified as occupational dermatitis.

Under the heading of chronic allergic inflammation are included two types of skin sensitization—that to known allergens and that to an unknown allergen.

1. Cases of skin sensitization to known allergens all come under the heading of infective dermatitis, and there are the following two sub-headings:

(a) The type of *otitis externa* caused by *pityriasis simplex* or dandruff of the scalp as a direct contagion followed by sensitization. Seborrhoeic dermatitis is probably due to sensitization to the bottle bacillus (*pityrosporon of Malassez*), a yeast-like microorganism susceptible to sulphur, and the cause of *pityriasis simplex*. This chronic condition is also commonly associated with *Staphylococcus albus*, but may, in addition, show a sensitization to some other microorganism, such as *Bacterium coli*, in cases of *otitis externa*. This type is subject to acute and subacute exacerbations, sometimes with a superimposed bacterial infection that can be demonstrated by culture.

(b) The type of *otitis externa* which arises from sensitization to a microorganism that can be demonstrated repeatedly during acute and subacute exacerbations, but which is not associated with dandruff of the scalp, as far as can be judged clinically. The three most common microorganisms in this series in their order of frequency are *Staphylococcus aureus haemolyticus*, *Bacterium coli* and *Pseudomonas pyocyannea*. Of these three microorganisms *Bacterium coli* is by far the most troublesome to treat and sets up the most chronic conditions. This also obtains in *otitis media*.

2. Skin sensitization to an unknown allergen is a theoretical sub-heading, and the condition may or may not exist in the external meatus. There is no case in this series which could be placed under this sub-heading with any confidence, because if it is assumed that skin sensitization did occur, in all probability a superimposed infection would quickly develop that would obscure the whole picture. The sub-heading has been included only because such sensitizations to an unknown allergen are known to occur in the skin on other parts of the body.

In all cases coming under the heading of "chronic allergic inflammation" there has been a history of from three months to thirty-six years' duration prior to treatment.

Comment.

It must be admitted that the foregoing classification is partly theoretical, but it does cover most of the manifestations of *otitis externa*, and at least gives some kind of working basis for treatment.

The well-known fact that the application of soap and water (either fresh or salt) will in many instances cause a flare-up of chronic *otitis externa* would seem to point clearly to the existence of an underlying skin sensitization, apart altogether from the usual symptoms of oedema, itching, redness and weeping, which characterize these lesions in their acute and subacute stages, and the itching and scaling which are found in the chronic state of the disease. It is probable also that maceration of the skin by water is a contributing factor.

Chronic seborrhoeic dermatitis of the scalp and skin has been included under the heading of a chronic allergy, in view of the chronic nature of this skin condition and of the itching and scaling it produces.

The bulk of the conditions treated in this series of 336 come under the third heading of the foregoing classification. In the second group of conditions under "skin sensitization to known allergens" the condition probably arises from an original simple infection, as in the third section of the first heading ("acute simple inflammation").

TABLE I.

Otitis Externa.	Number of Cases.
<i>Staphylococcus aureus haemolyticus</i> ..	55
<i>Bacterium coli</i> ..	37
<i>Pseudomonas pyocyannea</i> ..	21
<i>Streptococcus haemolyticus</i> ..	1
<i>Streptococcus non-haemolyticus</i> ..	2
<i>Staphylococcus albus</i> ..	38
<i>Staphylococcus aureus</i> ..	9
<i>Diphtheroids</i> ..	6
<i>Proteus vulgaris</i> ..	2
<i>Bacillus prodigiosus</i> ..	1
<i>Bacillus subtilis</i> ..	1
No growth ..	11
Total	184

If in the beginning the latter simple frank infection has not been treated kindly and satisfactorily over a sufficient period of time and with careful observation, some of the infection remains, probably in that small, shallow, nameless inferior sulcus where the epidermis is reflected off the meatal wall onto the tympanic membrane.

As is well known, the presence and position of this sulcus are variable. Sometimes it is not present at all, sometimes it is situated anteriorly, sometimes posteriorly, and sometimes both anteriorly and posteriorly. This state of affairs would seem again to depend on variability in the shape of the external meatal canal itself, associated possibly also with variability in the plane in which the tympanic membrane is set.

Unless the meatus is treated with some medicament that is sufficiently liquid to penetrate this sulcus, if present infection will remain, and in time the skin may become sensitized.

During exacerbations, which occur most commonly in the hot weather, an acute or subacute infection of either the original sensitizing microorganism or a totally different superimposed microorganism, will occur. This, at any rate, provides the theory on the basis of which all conditions coming under the third heading have been treated.

It is regretted that over the past four years culture swabblings were not taken as a routine measure from all moist ears. These, however, have been taken over the period from September, 1949, until today, and they will of course continue to be taken. The practice of taking swabblings from dry scaly ears has been partly discarded, as examination of these revealed either *Staphylococcus albus* or no organisms.

Table I shows the results so far obtained.

It is absolutely essential to know, if possible, the micro-organism with which one is dealing, whether it is Gram-positive or Gram-negative, and to adapt the correct treatment to the pathogen or predominant microorganism grown on culture. Failure to do this in this series prior to September, 1949, made routine treatment more difficult and more prolonged, as one had been working much more empirically with a wider range of trial and error.

It must be borne in mind that the results shown in Table I hold good only for the particular period of time—namely, September, 1949, until today—over which they were obtained.

In this table the almost entire absence of streptococcal infections and also the comparatively low incidence of *Pseudomonas pyocyanea* infections are noteworthy in this series.

For some months now all swabbings from cases of *otitis externa* have been cultivated on Sabouraud's medium as well as on blood agar. At the present time not enough evidence from Sabouraud's medium is available to allow any conclusion to be drawn, but it can be stated that, so far, very few growths of fungus have been obtained.

Although the symptoms of seborrhoeic dermatitis of the scalp and skin are well known, a few points about this chronic and mischievous condition will be mentioned.

In spite of the fact that dandruff of the scalp can be completely cleared up and kept clear by daily treatment, it is seldom completely cured, and it is this fact which can be misleading in the treatment of *otitis externa*. Many patients in this series, showing the typical dry, scaly type of seborrhoeic dermatitis in the external meatus, have been carefully examined and have been found to be free from dandruff of the scalp. Treatment with tar preparations has cleared the *otitis externa*, but, at a later date, while the patient was still under observation, dandruff of the scalp has made its appearance. When these patients have been questioned it has been found that, at the time of their first examination, they had been using some kind of hair lotion which had cleared the dandruff of the scalp and kept it in abeyance. They had then stopped using the lotion and in a week or two the dandruff had returned.

Constant reinfection of the ears from the scalp accounts for the chronicity of the seborrhoeic type of *otitis externa*, and it needs only a mild, in some cases a hardly noticeable, infection of the scalp to set up a chronic involvement of the external meatus.

There is, of course, another very common source of additional contagion of the scalp, and that is the barber, whose implements, particularly his clippers, which cannot be and never are sterilized, are impregnated daily with a rich and variegated assortment of dandruff from his many clients. What a pity it was that the barber-surgeon underwent his inevitable dichotomy before the days of Lister, and that his tonsorial failed to follow his surgical high down the fragrant paths of antisepsis!

One cannot stress too greatly the important part played by dandruff of the scalp as an exciting allergen in the causation of the chronic scaly type of *otitis externa*, and of the acute and subacute exacerbations and recurrences which are so common from direct contagion and superimposed infection. Of the cases in this series, 86% were associated with and were probably originally caused by dandruff of the scalp.

It is not difficult to visualize what happens when masses of humanity are aggregated together in the services, where facilities for washing and the application of hair lotions are often non-existent and the regimental barber has a clear run of unrestrained dissemination. What a rich soil this is, apart from service conditions, for the implantation of microorganisms, all so conveniently provided by the introduction of a wonderfully mixed flora into pools and swimming baths under warm tropical suns!

There is another clinical type of bilateral *otitis externa* which is worthy of mention. Fortunately for everyone concerned, it is comparatively rare. Only two cases occurred in this series. This type of lesion is characterized by massive, chronic oedema of both auricles, which are

greatly enlarged, deformed and slate-coloured in appearance in the chronic stage. The meatal canals are swollen, oedematous and moist, and it is impossible to see far with a speculum. There are partially healed splits in the skin above and below the external openings of the meatus, and there is, of course, considerable impairment of hearing. These patients are subject to very severe exacerbations, in which both auricles suddenly become much more swollen, oedematous, raw and red, and weep copious serum over the whole skin surface. Old splits and fissures widen and deepen and become excessively painful. During an acute attack the patient frequently has an elevated temperature. One of the two patients was in and out of hospital with a severe local and general reaction and an elevated temperature for two or three years before treatment. At this stage the oedema, which started as allergic inflammation, has become converted into active cellulitis that may spread onto the cheek, particularly in front of and below the auricle.

These conditions are primarily due to sensitization to *Bacterium coli* as far as it is possible to prove them so. In the chronic stage original and subsequent swabbings yielded a culture of *Bacterium coli*, but *Staphylococcus aureus haemolyticus* was present during the acute exacerbations, which subsided under the parenteral administration of penicillin or the oral administration of sulphonamides, or both in combination.

Exostoses.—Multiple exostoses complicated a number of cases, obstruction of the canal varying from a slight bulge or bulges in the canal wall to almost complete obstruction, only a very small opening being left. No evidence to support the statement that surf-bathing is an aetiological factor in their formation could be found. They were just as common in non-surf-bathers. It is difficult to understand how this conception ever arose and on what pathological grounds. If trauma to this area was considered to be the contributory factor, then surely the tympanic membrane should be the first to suffer, and not the hard, bony meatal canal. It is interesting to note that exostoses frequently occur in groups of three and often in the same plane, which causes almost complete blockage of the meatal canal.

Keratosis Obturans.—*Keratosis obturans* occurred in a few cases.

Treatment.

Before the treatment of *otitis externa* under the headings in the foregoing classification is discussed, a few general remarks may be worth making.

In dealing with *otitis externa* one of the most important factors in treatment is and always will be that of continuous personal supervision and observation.

At the beginning of treatment patients must be examined frequently, daily if possible, until it is reasonably certain that the condition is under control. After this, patients with the chronic condition should be kept under observation for a period of eighteen months to two years. This is essential, because all such patients should be observed through at least one summer. They must also be carefully instructed to report at once before the date given for their next visit if they find that their ears are itching or moist or worrying them in any way. These precautions are necessary, as many of these chronic cases have been in existence for periods of time varying from three months to thirty-six years, and have passed through many exacerbations and remissions.

Before antibiotics are used either locally or parenterally, the patient should, of course, be carefully questioned as to whether antibiotics have been used in his past treatment for any condition and with what effect, with particular reference to the occurrence of sensitization.

As any patient with acute *otitis externa* is liable to become sensitized, and as all patients with chronic *otitis externa* are already sensitized, it is extremely undesirable to treat any of them with any kind of strong irritant, such as solutions of silver nitrate (20%) or any strong caustic or antiseptic. Such strong applications no doubt remove for the time being any infection, frank or superimposed on an allergic field, but they will also remove

most of the epidermis and expose fresh tissues to infection, apart altogether from the more serious damage inflicted on the underlying sensitized area in chronic cases. What effect repeated applications of a 20% silver nitrate solution may have on the intact tympanic membrane one does not know. It is certainly a valuable application for cauterizing granulations in *otitis media*. On the whole it would seem wiser to treat *otitis externa* kindly and often, rather than to try to abolish it heroically by one or two shattering applications followed by immediate or remote repercussions. Most dermatologists, one hopes, will agree that such strong applications are not suited in acute, subacute or chronic skin allergies affecting any other part of the body.

Many methods of treatment have been used in this series, and they have been divided into two groups as follows: (i) new preparations or combinations of preparations; (ii) standard preparations already in use.

New Preparations and Combinations of Preparations.

Sodium thiosulphate was the original preparation to be tried. As is well known, this compound breaks down rapidly in an acid medium, gives off sulphur dioxide gas and deposits sulphur in accordance with the following equation: $\text{Na}_2\text{S}_2\text{O}_3 + 2\text{HCl} = 2\text{NaCl} + \text{SO}_2 + \text{S} + \text{H}_2\text{O}$. It was, therefore, considered as a possible cure for the seborrhœic type of *otitis externa*. It was used in 20% strength in boracic powder and in glycerin. The latter combination proved to be the better in *otitis externa*, but unfortunately at the time of its trial it was not realized that dandruff of the scalp was the main source of contagion (and consequent recurrences), and no classification of the different types of *otitis externa* had been attempted. A large percentage, however, of the mild scaly types of seborrhœic *otitis externa* were cleared up and remained so after this method of treatment. It can, therefore, be held that 20% sodium thiosulphate solution in glycerin constitutes another valuable form of treatment in seborrhœic *otitis externa*, provided that the scalp is treated regularly. Another attribute of sodium thiosulphate is that it readily destroys fungus, and it should be used if any fungi are grown from swabblings cultivated on Sabouraud's medium.

A variety of tar preparations of varying strengths have been tried, as follows: (i) *Liquor Picis Carbonatis*, 0.5% to 5%, in distilled water. These solutions have a limited value in some cases in which oily preparations are not tolerated, particularly in the hot weather. (ii) *Liquor Picis Carbonatis*, 2.5%, in glycerin. This was tried in a small series of cases with varying and not wholly satisfactory results. (iii) *Pix Carbonis* (crude coal tar), 0.1 part, in olive oil, 100 parts. This has proved a very valuable preparation for treating the deep half of the meatal canal and the tympanic membrane. (iv) White's tar paste. This consists of starch eight parts, *Pix Carbonis* one part, zinc oxide one part, and soft paraffin eight parts. (v) *Pix Carbonis* one part, Lassar's paste 100 parts. This is useful after the application of gentian violet (2% aqueous solution) in obstinate subacute sensitizations.

Streptomycin and penicillin have been combined as a local instillation. Streptomycin and penicillin solutions are prepared by adding 20 millilitres of double-distilled pyrogen-free water to one gramme of streptomycin and 200,000 units of penicillin respectively. These solutions are, of course, made up in the original bottles, and when they are required for use two medium-sized sterile needles are inserted through the rubber caps and a one-millilitre "Record" syringe is used as dropper. The meatus is filled with equal parts of the solutions, and a wick is inserted with a cotton-wool plug on the outside. The wick is left in for twenty-four hours.

The chief use of this combination of antibiotics is to inhibit subacute and acute purulent infections. Reports on the local application of penicillin alone in the treatment of *otitis externa* during recent years have, in a large percentage of cases, been disappointing. There are several factors which probably had some bearing on this failure.

Firstly, penicillin was used indiscriminately in every case of *otitis externa* irrespective of the causal or super-

imposed microorganism present at the time of treatment. It is clear that this antibiotic would be of little value in inhibiting the action of a Gram-negative microorganism such as *Bacterium coli*. From Table I it can be seen that the total number of Gram-negative microorganisms (*Bacterium coli* and *Pseudomonas pyocyanus*) cultivated in cases of *otitis externa* is greater than the number of Gram-positive pathogens (*Staphylococcus aureus haemolyticus*). It is small wonder, therefore, that penicillin, when used alone by local application, had a high percentage of failures.

Secondly, penicillin was applied too frequently and without proper supervision in many instances, and this often led to skin sensitization, more particularly in cases of infection by Gram-negative microorganisms. Thirdly, it has been applied without due regard to the state of the meatal canal at the time of treatment.

Penicillin should be used locally only to inhibit acute and subacute infections. Application of penicillin in the chronic scaly state led either to no improvement or to acute allergic sensitization.

There is a fourth possible explanation, which is given for what it is worth. Mixed infections are frequently met with in *otitis externa*, and it is possible that, in conjunction with a Gram-positive infection by *Staphylococcus aureus haemolyticus*, there might exist some Gram-negative penicillinase-forming microorganisms, such as *Bacterium coli* or members of the paracolon group. These might be present in sufficient numbers to destroy penicillin, but in insufficient numbers to be picked up by a swab for culture. Cases do, of course, occur in which both *Bacterium coli* and *Staphylococcus aureus haemolyticus* are grown on culture from the same ear.

Sulphacetamide in strengths varying from 20% to 50% has proved valuable in many instances, particularly against Gram-positive microorganisms. As has already been mentioned, this liquid sulphonamide does not often sensitize the skin. Like other methods of treatment, in some cases it renders the epidermis sodden, and is therefore not suitable; but up to date only a few cases have occurred in which it has set up an allergic state comparable with that produced by penicillin, iodine or sulphonamides in powder form.

"Chloromycetin" is used in the form of a cold cream by mixing four grammes of "Chloromycetin" with one ounce of "Unibase" (Parke, Davis). The latter contains higher fatty alcohols—petroleum, glycerin, water and an emulsifying agent—in such proportions that incorporation of both water-soluble and water-insoluble drugs is accomplished with ease. It is compatible with all therapeutic agents commonly employed in dermatology. This cream is useful for application to the meatal canal after the use of streptomycin in Gram-negative infections.

Gentian violet has been used in a 2% aqueous solution. The good qualities of this dye are that it is bactericidal, it is non-irritating to the skin, and it dries up weeping lesions. Its obvious disadvantage is that it obscures the anatomy of the meatal canal. It is of great value, nevertheless, in a certain stage in the treatment of *otitis externa* and *otitis media*. This will be referred to later.

Many other preparations were tried. These included the following: *Extractum Hamamelidis Liquidum* (distilled) alone and combined with 20% sodium thiosulphate solution, menthol, and some urea preparations in glycerin and powder vehicles. None of these were found to be of any use.

Standard Preparations Already in Use.

Among the standard preparations already in use were the following: (a) ichthyl and glycerin (10%). (b) *Unguentum Picis Carbonis Compositum*. (c) Burow's solution—aluminium acetate (8%). This clears the *otitis externa* in some cases, but in many it recurs, as the solution does not control the underlying sensitization—in fact, in some cases it aggravates it, and in many cases a causal or aggravating dandruff of the scalp has not been treated. The chief function of the solution appears to be the removal of the epidermis together with some of the infecting micro-organisms.

Acute Simple Inflammations.

There is little to add to the usual methods of treating acute simple inflammatory conditions. The daily application of ichthylol and glycerin wicks (10%) for small furuncles, combined with the local application of heat, still suffices to clear these lesions satisfactorily. *Spiritus Vini Rectificatus* wicks were not used in this series, although they are probably equally successful.

For larger furuncles and carbuncles ichthylol and glycerin wicks (10%) should be inserted every four hours, preferably with the patient in hospital, and this treatment is supplemented by daily injections of 300,000 units of penicillin in the form of "Distaquaine".

After the lesion has been dispersed it is advisable to put the patient on a three-months' course of vitamin B complex tablets (two tablets three times a day), especially if furunculosis shows a tendency to recur, and at the same time to instil sulphacetamide drops (30%) locally twice a week for a few weeks.

Cellulitis as a complication of either splits in the external meatal opening or large furuncles is treated on similar lines.

If admission to hospital and the parenteral use of antibiotics is not possible, the patient is given an oral course of sulphonamides, preferably triple sulphonamide tablets or the army "B" course of sulphamerazine.

The infecting microorganism is almost invariably found to be *Staphylococcus aureus haemolyticus*.

After a swab has been taken, simple frank infections are treated by gently syringing the meatus free of pus and débris and drying it out with or without spirit.

Three consecutive daily instillations of equal parts of streptomycin and penicillin with wicks clear the infection. After this *Unguentum Picis Carbonis Compositum* is applied to the meatal walls, and the patient is examined daily until the skin becomes normal in appearance. If any further treatment is required, this will depend on the nature of the infecting microorganism. If the latter is Gram-positive, sulphacetamide drops (30%) can be given, to be used twice a week, and in the case of Gram-negative infections "Chloromycetin" cream can be applied once or twice. These patients should be watched for a year or more at intervals varying from one to two or three months, to make sure that there has been no sensitization.

Acute Allergic Inflammations.

The first step in treating acute allergic inflammatory conditions is to stop the use of the particular allergen concerned and then to use ichthylol and glycerin wicks (10%) once a day or every four hours, according to the severity of the inflammation. The auricle, which is weeping and covered with honey-coloured crusts and beads of serum, is treated several times daily with *Unguentum Picis Carbonis Compositum* after gentle cleansing and removal of serum and crusts to enable the ointment to reach the underlying skin infection. After the acute inflammation, which is readily brought under control, has subsided, then treatment of the original condition is started or continued, as the case may be.

Chronic Allergic Inflammations.

The treatment of the seborrhoeic types of *otitis externa*, as in the case of all allergies, must vary, of course, with the state in which the patients are found; but the most important part of the treatment is to deal with the scalp as well as the ears.

Patients are impressed with the prime importance of this, and are told that they must continue to use daily for the rest of their lives the scalp lotion prescribed.

In the mild cases of *pyriasis simplex* of the scalp the best application is the following: *Oleum Ricini* six to eight drachms, *Acidum Salicylicum* 0.5 to 1.0 drachm, *Spiritus Vini Rectificatus* to eight ounces. *Oleum Lavendulae* can be added for the more fastidious. The amount of castor oil and salicylic acid can be varied to suit particular patients. The standard preparation used in this series contained six drachms of castor oil and one drachm of salicylic acid. This lotion should be used daily after the head has been washed (preferably with coal tar soap) and dried, and should be thoroughly rubbed into the scalp

as a dry shampoo as well as a hair dressing. Patients are instructed after visiting the barber to wash the head thoroughly the same night and to use the lotion again to combat any added contagion. In severe cases the patient uses the foregoing lotion twice a day and at night the following application: sodium thiosulphate 20 parts, water 100 parts. As the pH of the skin secretions is below 7.0, this solution breaks down on contact with the skin and gives off sulphur and sulphur dioxide, as has already been mentioned. This application is superior to other sulphur remedies, which are usually prescribed in the form of an ointment that is very messy for use on the scalp and is somewhat redolent of brimstone and treacle applied to the wrong surface.

If the meatus is in the chronic scaly state, it is treated with *Unguentum Picis Carbonis Compositum*, which is applied daily to the auricle and surrounding skin, if involved, to the meatal opening (with special attention to splits above and below), and half-way down the canal itself.

The deeper half of the canal and tympanic membrane are treated by slow instillation into the meatus down the posterior wall of two or three drops of one of the following preparations: (i) *Pix Carbonis* (crude coal tar), 0.1 part, in olive oil, 100 parts; (ii) sodium thiosulphate, 20 parts, in glycerin, 100 parts. This is done twice weekly at night only and a cotton-wool plug is inserted. The latter is removed in the morning and not replaced, as the meatus should be left open to avoid overheating.

One need hardly add that these drops do not necessarily agree with the skin in all cases, particularly in the hot weather, and the ear must be kept under daily observation until the meatus is normal or requires different treatment.

If these oily drops make the skin sodden, it has been found that sulphacetamide drops (20% to 30%) will sometimes give good results in combination with the continued use of *Unguentum Picis Carbonis Compositum*, as outlined above. Sulphacetamide is of special value, of course, in Gram-positive infections, but it is also of value in Gram-negative infections, because it tends to prevent the occurrence of a superadded Gram-positive infection, which is frequent. This will be referred to again in the discussion of the treatment of *otitis media*.

If the ear condition is in the acute or subacute state, it is treated, after a swab has been taken for culture, in the same way as a simple frank infection, and this in turn is followed by the above-described treatment for chronic underlying sensitization.

Whether the culture from the swab shows a Gram-negative or a Gram-positive infection does not matter, if the acute or subacute condition is treated with streptomycin and penicillin combined. In any case it takes several days to learn the culture results. If the report shows the presence of a Gram-negative or a Gram-positive microorganism and there is a relapse, it is wise to treat the ear a second time with streptomycin alone or with streptomycin plus penicillin respectively. This avoids the risk of penicillin sensitization in a Gram-negative infection. No case of sensitization to streptomycin was recorded in this series.

If, after treatment by the two antibiotics, the canal wall still looks sodden instead of scaly, a trial of treatment with sulphacetamide or "Chloromycetin" cream should be given in Gram-positive and Gram-negative infections respectively.

Pseudomonas pyocyanea infections usually clear readily after the instillation of streptomycin, followed by the application of "Chloromycetin" cream or *Unguentum Picis Carbonis Compositum*.

It is found, particularly in hot, humid weather, that in some cases the condition will not respond to antibiotics after the initial purulent infection has been inhibited, and that the meatal canal remains sodden. This condition is apparently due to the existence of an underlying subacute allergic state and does not react favourably to tar ointments and oils. The meatus should then be treated with one or more applications of gentian violet (2% aqueous solution). The meatus is half-filled with the dye and the bulk is then removed with a cotton-wool

pledget, a film of dye being left to cover the meatal wall and tympanic membrane. The skin usually settles down after this treatment and in a few days any further treatment that may be required can be carried out. In the majority of these troublesome cases a *Bacterium coli* infection is found on the initial swab.

All patients are warned, of course, to keep soap and water out of their ears, to plug their ears with cotton wool smeared with *Unguentum Picis Carbonis Compositum* before having a shower or washing the head, and finally to stop swimming and surf-bathing. When a patient's ears are considered to be clear and he is only under observation, the question arises whether he may be allowed to swim or surf-bathe again. This is advised only under certain conditions. Before going into the water the patient must insert some *Unguentum Picis Carbonis Compositum* into both meatuses and then wear a suitably fitting rubber or moulded "Plasticine" plug. He should report once a month or at once if any symptoms arise.

Exostoses are a troublesome complication in the treatment of *otitis externa*, especially when they obstruct vision of and therapeutic access to the tympanic membrane. A certain degree of reduction of the tissue swelling over these exostoses can be achieved by the persistent use of ichthylol and glycerin wicks (10%) or wicks soaked in 1 in 1000 adrenaline solution.

Although the meatal canals must be kept clear of débris, it is advisable to syringe them as little as possible in the treatment of *otitis externa*.

A few observations will be made here with regard to the treatment of the two patients with chronic bilateral *otitis externa* mentioned above. These, as has already been stated, had gross deformity of both auricles with moist, edematous, blocked canals, deafness and the most severe acute exacerbations.

CASE I.—This patient was originally examined on September 2, 1947, and from that date up to the present time has attended the clinic well over 600 times. Every form of treatment was given a thorough trial over the years, and the best results in this case were obtained by the persistent use of ichthylol and glycerin wicks (10%) three times a day. He attends the clinic twice a week, and for the rest of the week the wicks are inserted at home.

Attempts to open up the meatal canals with wicks soaked in adrenaline solution (1 in 1000) met with little success. Antibiotics and *Unguentum Picis Carbonis Compositum* did not agree.

It might be wondered what all this work spread out over the years really did achieve. Suffice it to say that his original condition was deplorable. His ears were deformed and swollen, the meatuses were completely blocked by edematous tissue, both ears were discharging, more particularly the left, which later was affected by *otitis media* as well as *otitis externa*, and he was subject, from time to time, to the most severe exacerbations, which compelled his frequent admission to hospital; in fact, he was in and out of hospital constantly for three years before treatment at the clinic.

Today his ears are normal in shape and colour, the hearing in his right ear has improved considerably, a view of portion of both tympanic membranes is possible, and he has not had an acute exacerbation for over two years. His left ear is still discharging and the *otitis media* is, as yet, an unsolved problem. Local streptomycin therapy did not agree with this patient and had to be stopped. Twice weekly applications of "Chloromycetin" on wicks, however, seem to have improved the condition of both ears recently. The ichthylol and glycerin treatment is carried on at home in the intervals between visits.

CASE II.—This case was clinically similar to the first, except that the condition had not been in existence for the same length of time, was not complicated by *otitis media*, and was, on the whole, not quite so severe.

The meatuses were treated with strengths of sodium thiosulphate varying from 20% sodium thiosulphate in boracic powder to pure sodium thiosulphate. The latter gave good results up to a point. It was finally decided that, after the canals had been opened with wicks soaked in adrenaline solution (1 in 1000), tar preparations gave the best results. *Unguentum Picis Carbonis Compositum* was tried first, but better results were obtained with the following: (i) *Pix Carbonis* one part, Lassar's paste 100 parts; (ii) White's tar paste. Recently "Chloromycetin" cream has been used and appears to be a suitable application. The present state

of the patient's ears is very gratifying. He has had no serious exacerbation for three years, but has to be under observation from time to time. He has been treated intermittently since April 15, 1947.

OTITIS MEDIA AND MASTOIDECTOMIES.

Since 1947 a series of 206 patients suffering from *otitis media* and having undergone mastoidectomies has been treated and a variety of treatments has been tried.

Otitis Media.

The number of cases of *otitis media* was 171. All types of perforation have been met with, both central and marginal, and have been treated by conservative and surgical means according to their state.

As is generally recognized, attic and postero-superior perforations are the most likely to require surgical intervention, especially when cholesteatosis, multiple granulations and large polypi are present.

Central perforations, of course, are on the whole more readily amenable to treatment, but the abolition of otorrhoea must still depend to a large extent on the degree of patency of the Eustachian tubes.

TABLE II.
Otitis Media.

Infecting Organism.	Number of Cases.
<i>Bacterium coli</i>	34
<i>Staphylococcus aureus hemolyticus</i>	27
<i>Pseudomonas pyocyanus</i>	15
<i>Streptococcus hemolyticus</i>	1
<i>Streptococcus non-hemolyticus</i>	1
<i>Hemophilus hemolyticus</i> ¹	1
<i>Bacillus focalis alkaligenes</i>	1
<i>Staphylococcus albus</i>	14
<i>Staphylococcus aureus</i>	4
Diphtheroids	6
None detected	5
Total	109

¹ This is a microorganism described only in American text-books.

From the point of view of prognosis, therefore, the cases in this series have been divided into two groups: (i) Those in which the Eustachian tubes were closed and consequently no "blow-through" occurred on Valsalva's test. These are subdivided as follows: (a) cases in which no complications were present; (b) cases in which polypi were present in the middle ear; (c) cases associated with middle-ear granulations, cholesteatosis, and necrosis of the ossicles or mastoid cell infection or both in combination. (ii) Those in which the Eustachian tubes were patent with a moderate or gross "blow-through" on Valsalva's test, and with or without the foregoing complications.

Provided that all complications can be satisfactorily dealt with by conservative or surgical measures, the prognosis for cases in the first group and for certain cases in the second group (in which the degree of patency is moderate or small) is good.

In the second group, however, cases occur in which there is gross patency of the Eustachian tube with a free "blow-through" on Valsalva's test, and the prognosis is not quite so pleasing, for the obvious reason that, in spite of all conservative and surgical measures, the widely patent Eustachian tube still lays open the middle ear to recurrent infections from the pharynx.

On the other hand, it has been found that these latter patients can be kept under control, their treatment standardized and otorrhoea reduced to an odourless minimum. Such patients with gross patency of the Eustachian tube did not form a very high percentage in this series.

With regard to the bacteriology of *otitis media* in this series, Table II gives the flora cultured over the period from September, 1949, until today.

The standardized treatment of *otitis media*, which has been used in this series, is the following:

1. When the patient is first examined, a swab is taken for culture.

2. The ear is cleansed and filled with equal parts of streptomycin and penicillin and a wick is inserted. As in *otitis externa*, this procedure is repeated daily for three consecutive days, and in many cases the ear dries up. If the ear is not dry, treatment is continued until the result of the swab culture is known. If the infecting microorganism is *Bacterium coli* or *Pseudomonas pyocyanea*, a further course of streptomycin therapy alone is given, or a wick well impregnated with "Chloromycetin" (four grammes in "Unibase") is inserted daily for a week.

If, on the other hand, the microorganism is a haemolytic *Staphylococcus aureus*, the patient is given sulphacetamide drops (30% to 50%) to be used daily after cleansing the ear, or a further course of streptomycin and penicillin. He then reports weekly. If these measures fail, he is then provided with an insufflator and instructed to cleanse the ear night and morning and insufflate it with sodium thiosulphate in boracic powder. He then reports monthly. In many cases the ear remains clear, with occasional relapses which are readily controlled in a day or two by insufflation. Sodium thiosulphate must be kept hermetically sealed when not in use, as it gives off its sulphur dioxide and deposits sulphur if exposed to the air for long. It should not, therefore, be supplied in too large quantities. It is a most valuable deodorant.

If, during treatment, small polypi or granulations appear, they are treated by cauterization in the usual way with either trichloroacetic acid or silver nitrate (20%). Larger polypi, of course, have to be dealt with surgically. If the discharge remains persistently foul, if granulations or cholesteatosis are visible through the perforation, and if there are clinical and radiological signs of chronic mastoiditis, then the case is one for the surgeon. The attic and postero-superior perforations are, of course, those most commonly associated with cholesteatosis, necrosis of the ossicles, and mastoiditis.

When free of complications the condition in all cases in the first group clears up, in a large percentage in a very short time, and it does not recur.

Cases in the second group are, on the whole, more troublesome and the condition takes longer to clear; but a large percentage of patients are free for long periods with occasional relapses, and in many instances the "blow-through" on Valsalva's test is abolished and they remain well. In the remaining small percentage of cases the condition never quite dries up, but is kept more or less under control by insufflations carried out regularly at home after an ear toilet twice a day. If the patient does this conscientiously, he is little trouble to himself or others.

The use of gentian violet (2% aqueous solution) is another method of treatment which can be given a trial.

Many cases occur in which, although there is no middle-ear discharge, the meatus nevertheless remains moist. This state of affairs in many instances is due to *otitis externa* set up either by the original middle-ear infection or by concomitant dandruff of the scalp. The condition is usually amenable to the treatment outlined above, and many moist ears with no "blow-through" on Valsalva's test can be completely dried.

Preparations of urea in various vehicles were tried and were found to be useless.

Mastoidectomies.

Under the heading of mastoidectomies (35 cases) comes a variety of post-surgical presentations ranging from the end-results after modified radical endaural operations to mastoid cavities, with or without patent Eustachian tubes, exposed post-aurally or endaurally. These patients report either with frank discharge or with discharge with crusting on exposed surfaces.

Each patient has to be treated individually according to his requirements, after the standard treatment with streptomycin and penicillin has been given a thorough

trial, the appropriate antibiotic or combination of antibiotics being used to inhibit the infecting microorganism found by culture.

One patient who had undergone a radical mastoidectomy and had a "blow-through" with profuse tenacious, glutinous, mucoid discharge, gave negative results to attempted culture of pathogens for years. He is an asthmatic, and it was found that the discharge became profuse during asthmatic attacks and lessened when they subsided. The Eustachian tube in this case is grossly patent. In the past the condition has caused him to lose a lot of employment, partly because the ear was pouring discharge, needed constant attention and was offensive to others, and partly because he had so much time off trying to get satisfactory treatment. The whole middle ear *et cetera* in this case is clearly sensitized and takes part in an allergic flare-up with each asthmatic attack. During a recent attack, *Staphylococcus aureus haemolyticus* was recovered from the discharge. For nearly two years now he has been treated twice weekly with streptomycin and penicillin, and in the intervals between attendances he has been cleansing the ear twice daily and using sulphacetamide drops (50%). Adrenaline (1 in 1000) was tried during asthmatic attacks as a local application on wicks, but was found to be of little value.

This very troublesome ear after years of treatment has now been brought under control, to the extent that the patient is in regular employment and the condition is little trouble to himself or others. There have been periods recently during which the ear has been practically dry for two months.

Another patient had had in the past a radical mastoidectomy followed by two further mastoid operations. The last operation could not be completed, as there were infected cells too near the facial canal for safe removal and they had to be left *in situ*. This patient attends twice weekly and will continue to do so for the rest of his span. For the past year he has been using sulphacetamide drops (50%) every night, a large number of drops being instilled into the cavity while he is lying in bed. Although the infecting microorganism is *Bacterium coli*, sulphacetamide protects the exposed surfaces from further infection by Gram-positive microorganisms. Very little in the way of ear toilet is now required on his attendances. Packing of the cavity with gauze impregnated with "Chloromycetin" cream did not appear to make any difference.

Another very troublesome case concerned a patient who had had bilateral radical mastoidectomies performed in the past, and both cavities are infected with *Bacterium coli*. Prolonged treatment with antibiotics gave temporary improvement, and "Chloromycetin" wicks cleared them both for a week, but a further relapse occurred. This patient has been treated for several years and still presents a problem. On the whole the best results in his case have been obtained with insufflations of sodium thiosulphate (20%) in boracic acid powder after ear toilet twice a day.

There is no doubt that *Bacterium coli* is the most troublesome microorganism to deal with in any ear condition, whether it is *otitis externa*, *otitis media* or a mastoidectomy, and it is to be hoped that, when "Chloromycetin" is available in unlimited quantities, more progress may be made by the use of stronger local applications.

STATISTICS.

For the purpose of assessing results, as far as it is possible to do so, the series of cases of both *otitis externa* and *otitis media* has been divided into a recent series and a past series.

The recent series comprises the majority of those cases in which cultures have been prepared as a routine measure and in which consequently treatment has been on more rational lines, with quicker and better results.

The past series comprises those cases in which the patients have been discharged from the clinic as "clear" and those in which the patients failed to keep their last appointments and disappeared.

A small number of these had cultures taken, a proportion were treated with streptomycin and penicillin without identification of the bacterial infection involved, an even larger proportion were treated before the advent of streptomycin in this country, and in many earlier cases the patients were treated before the part played by dandruff of the scalp in relation to *otitis externa* was fully appreciated.

Streptomycin has been used in the clinic ever since it first became available in Australia.

It is generally recognized that statistics are often inaccurate and sometimes misleading. In the following tables, therefore, no attempt has been made to give percentages of successes or failures, and the figures are set out for what they are worth (Tables III, IV and V).

TABLE III.
Otitis Externa.

Group.	Number of Cases.		
	Recent Series.	Past Series.	Both Series.
Total	123	213	336
Total "clear"	88	39	127
With seborrhoeic dermatitis of the scalp	106	—	—
Still under treatment	35	—	—
Tar-sensitive	2	—	—
Sulphacetamide-sensitive	3	—	—
With complicating right <i>otitis media</i>	1	—	—
With complicating left <i>otitis media</i>	2	—	—
With slight residual symptoms (no further outside medical treatment sought)	—	26	—
Having sought further outside medical treatment	—	35	—
Untraced	—	113	—

In the past series a questionnaire was sent out to all patients who could be traced, asking them whether they had had any itching or discharge from the ears and whether they had sought outside medical treatment since their last attendance at the clinic. It is admitted that, in some instances, any question asked of a patient will not meet with a satisfactory or an accurate reply, and this is particularly the case with pensioners. There is only one really satisfactory method of assessing results, and that is to have the patient up for examination, but, unfortunately, this was not practicable.

TABLE IV.¹
Otitis Media.

Group.	Number of Cases.		
	Recent Series.	Past Series.	Both Series.
Total	51	120	171
Number with "dry" ears	31	9	40
Number with "moist" ears	8	—	—
Still under treatment	12	—	—
With some discharge, but having sought no further outside medical treatment	—	20	—
With discharge, having sought further outside medical treatment	—	22	—
Untraced	—	69	—

¹ The details of the mastoidectomies are as follows: there were 35 patients altogether, of whom 16 had "dry" ears and 15 had "moist" ears; a discharge was still present in four cases.

One is therefore obliged to deduce what one can from the figures and material obtained.

A patient is considered to be free from infection when the meatal canal and the tympanic membrane look normal and he does not complain of any subjective symptoms referable to *otitis externa*. Such patients, of course, will relapse in some instances if they get soap and water and sea-water in their ears, and if they neglect to continue their treatment for dandruff of the scalp, if this is present. The term "cured", therefore, has been avoided in the tables that follow, and the term "clear" is used instead.

In Table III the number of cases recorded as being associated with dandruff of the scalp, as has already been

mentioned above, is over 86% in the recent series. Such records were not kept in the past series.

On examination of the cases recorded in the recent and past series in Table III it has been found that there is a certain amount of overlapping. For example, of the 88 cases recorded as "clear", 21 started in the past series and were carried over into the recent series and consequently registered a high total of attendances. In the calculation of the average number of attendances in this group these 21 cases have been omitted. The average number of attendances of the remainder worked out at 6.5.

Of the 39 cases assessed as "clear" in the past series, the average number of attendances for treatment worked out at 11.9. Of these the following numbers of patients were found to have been free of infection since: 1947, eight; 1948, nine; 1949, eleven; 1950, eleven.

Of the 26 patients who reported slight residual symptoms, some without doubt are "clear"; normal wax in two cases was reported as a discharge. In this group the average number of attendances was nine. At the date of the subjects' last visit the state of their ears was recorded as follows: "clear", 11; improved, nine; *in statu quo*, six. One patient was surf-bathing.

TABLE V.

Number of Attendances.	Length of Time Ear Dry Since Last Treatment.
14	Seven months.
3	Six months.
1	Six months.
1	Six months.
8	Six months.
18	Six months.
8	Five months.
13	Five months.
4	Three months.
10	Three months.
8	Two months.
4	One month.

In the group of 35 patients who sought outside medical treatment and who consequently must be regarded as "failures", the average number of attendances was 10.14. At the date of their last visit the state of their ears was recorded as follows: "clear", 15; improved, 14; *in statu quo*, 6.

One patient, a pilot, and consequently a bird of passage, attended the clinic three times and disappeared. His reply to the questionnaire is worth recording:

I wish to advise that since I left your Clinic I still suffered from "Tropical Ear". I also experienced considerable discharge whilst on flying duties and was forced to obtain a prescription from a Drug Store in Honolulu. For your information, since the application of this lotion my ears have completely cleared up. The prescription, from memory, consisted of Microzol [probably "Mycozol"], POWER ALCOHOL, BORACIC and METHYLATED SPIRITS.

One sincerely trusts that his ears have not "completely" cleared up under this treatment and that he has sufficient flaps left to see him jet-propelled through the stratosphere to many a happy landing. Who knows? This may prove to be the long-sought-for panacea.

Of this group three went away to the country in the middle of their treatment and one was a schizophrenic.

In Table IV the group of 31 cases of *otitis media* showed an average number of attendances of 11.3.

One patient had dry ears for seventeen months after three treatments, relapsed and had dry ears for four months after one treatment, relapsed again and had dry ears for six months after two treatments, relapsed again and has dry ears at the present time after five treatments.

One with an attic perforation and a small polypus has had a dry ear since June 7, 1949, after forty treatments, including cauterization.

One patient has had a dry ear for two years after three treatments. This ear had been discharging since 1943, and the longest period of dryness was six months prior to treatment at the clinic.

One patient has had a dry ear for eleven months after eight treatments, and another for eight months after four treatments.

Another patient has had a dry ear for eight months after three treatments. This ear first discharged in childhood; the discharge recurred in 1942 and had been present intermittently for two years, four months being the longest dry spell during that period.

Some further figures are given in Table V.

The remainder of affected ears have been dry for one month.

In the group of nine cases in the "past" series in Table IV the average number of attendances was 12.5. Of these, one patient had had continuously discharging ears for nine years and another for ten years. The ears have been dry for over two years.

In the group of 20 patients who state that they still have discharging ears but have sought no outside medical treatment, the average number of attendances at the clinic was 19.5. At the date of their last visit the state of their ears was recorded as follows: dry, 17; improved, three. One patient had had dry ears for four months, one for three months and two for two months prior to their disappearance.

In the group of 22 patients who sought outside medical treatment, the average number of attendances was 11. The state of their ears at their last visit was recorded as follows: dry, 13; improved, six; *in statu quo*, three.

One patient had had dry ears for eight months, one for seven months, one for three months, three for two months and one for one month prior to their disappearance.

The results in this group are disappointing and, with prejudice, one would like to think that some of the replies to the *questionnaires* were not accurate.

The figures for the mastoidectomies need no analysis.

SUMMARY.

1. The classification and treatment in 336 cases of *otitis externa* have been recorded.
2. The treatment in 171 cases of *otitis media* and 35 cases of mastoidectomy has also been recorded.
3. Statistics have been given and analysed.

ACKNOWLEDGEMENTS.

I wish to express my thanks to the Repatriation Commission for permission to publish this article, to Dr. E. McAustin Steel and Dr. R. B. Perkins for their helpful advice and criticism, and to Mr. A. J. C. Chalmers and the staff of the Repatriation Out-patient Clinic, Sydney, for their assistance.

PREGNANCY TOXÆMIA.¹

By W. F. JOYNT,
Adelaide.

I AM grateful for the invitation to take part in this discussion tonight, as it is only by such a discussion that the true role of the toxæmias as the present-day killer in obstetrics can be established.

For the purpose of this paper I have reviewed records from 1945 to 1950, inclusive. Toxæmia of pregnancy was directly responsible for 64.3% of all deaths during this period.

I propose to deal chiefly with preeclamptic toxæmia and eclampsia, and to exclude *hyperemesis gravidarum* and acute yellow atrophy of the liver. Hypertensive disease and renal insufficiency will be discussed only for purposes of differential diagnosis.

¹ Read at a meeting of the South Australian Branch of the British Medical Association.

Preeclamptic Toxæmia.

In a review of 8446 "booked" cases during the years from 1945 to 1950, the incidence of preeclamptic toxæmia was found to be 3.3% of all cases. This figure is probably too low, as it would include only those cases in which the patients were admitted to hospital for treatment.

The normal standard of blood pressure is taken as 130 millimetres of mercury, systolic, and 90 millimetres, diastolic, and there should be no increase above these levels in a normal pregnancy. It may be suggested that this standard is too high; but pregnancy occurs over a wide age group, and in an institution there must be some fixed standard. For the blood pressure to be regarded as abnormal, both systolic and diastolic pressures must be raised; I myself regard the diastolic as the more important.

Because of a scarcity of antenatal beds it has not been possible to admit to hospital all women whose blood pressure exceeds the normal standard; but my rule has been to admit to hospital any woman showing true albuminuria or any woman with a blood pressure of 140 millimetres of mercury, systolic, and 100 millimetres, diastolic, or upwards, who started her pregnancy with a normal reading. The true incidence of preeclampsia I would place as about 5% of all cases.

Aetiology of Pregnancy Toxæmia.

An enormous amount of work has been done in an attempt to find the cause of toxæmia. The theories advanced for its causation are legion, and range from intestinal and placental toxæmia through the dietetic and vitamin deficiencies to the hormonal dysfunctions. I do not propose to weary you with these theories; but there are certain clinical and pathological facts which would seem relevant.

1. Rapid improvement almost invariably follows emptying of the uterus or the intrauterine death of the fetus. While this rule is not absolute, the only exception to it is in the case of the prolonged inadequately treated toxæmia with irreversible changes in both liver and kidneys.

I recently had the opportunity of seeing a post-mortem examination on a woman who collapsed and died after a normal delivery without excess blood loss. She had had prolonged and moderately severe preeclampsia. The changes in the liver and kidneys were exactly the same as those seen in a severe case of eclampsia.

2. The lesions seen in the liver and kidneys in a fatal case of eclampsia are characteristic and almost constant.

3. Rapid improvement often follows restriction of the sodium ion intake, elimination, bed rest and sedation.

In an attempt to explain pregnancy toxæmia I should like to make certain suggestions which may have a bearing on the prevention of the condition.

1. The chorionic epithelium, which is not just a semi-permeable membrane but active living tissue, lies free in the maternal blood spaces. Fragments of the villi become detached and pass to the general circulation, where they are incompletely broken down by enzyme action into histamine-like products which produce liver damage and vascular hypertonus (Hofbauer, 1933; Kapeller-Adler and Adler, 1943).

2. It has been shown that by raising the intra-abdominal pressure in dogs, degenerative changes can be produced in the liver (Theobald, 1932). Toxæmia is outstandingly common in *primiparae* and is often associated with multiple pregnancy, hydatidiform mole and hydramnios. You have, I am sure, seen the improvement which often occurs in the toxæmic woman's condition after simple rupture of the membranes and drainage of the *liquor amni*.

3. There is increased activity of certain of the endocrines during pregnancy, particularly the thyroid and perhaps the adrenal cortex (Severinghaus, 1937). The concentration in the blood of the oestrogens and the chorionic gonadotropins is high during pregnancy (Smith and Smith, 1945). This activity tends to produce vascular hypertonus (Ward, Lyon and Bemis, 1928).

4. As a result of placental derivatives, vascular hypertonus and overactivity of the endocrines, particularly the thyroid, liver dysfunction occurs (Byrom, 1938). It is known that exposure to cold produces overactivity of thyroid and adrenals. Toxæmia is much more prevalent in this State at least during the colder months.

5. In a normal pregnancy acetylcholine acts as a vaso-depressor, being antagonistic to the pressor substance of the posterior pituitary body, and so tends to prevent vascular hypertonus (Inguilla, 1943). Owing to the disturbance in liver function and the abnormal placental enzymes, acetylcholine is not present in adequate concentration (Clark, 1929), so that there is inadequate opposition to vascular hypertonus, with the resulting development of the hypertensive state (Brown, 1943).

I would make the following suggestions for treatment, based on the foregoing observations, as being not unreasonable attempts to prevent the development of toxæmia.

1. Try to maintain the functional integrity of the liver. This may be done by adequate protein intake and perhaps the addition of the sulphur-containing amino acids together with vitamins *B* and *E* and calcium (György, 1944).

2. Try to prevent the development of the hypertensive state by the following means. (a) Diet. Restriction in caloric intake prevents undue gain in weight. It is also said to restrict the activity of the basophile cells of the anterior pituitary body (Williams and Harrison, 1939). Pituitary basophilism produces hypertension. A decrease in the incidence of preeclampsia was reported from Germany during World War I and from Holland during World War II (Smith, 1947). Both populations were underfed in these periods. (b) Enforcement of sufficient periods of mental and physical rest. I have no definite figures, but my impression is that toxæmia is less common in rural areas than it is in the city and suburbs.

Diagnosis.

The diagnosis presents little difficulty in a patient who has been observed from early pregnancy and who began her pregnancy normally. One of the striking characteristics of preeclampsia is the absence of symptoms, and the patient who presents symptoms is in a moderately advanced state. Excessive gain in weight is a fairly constant sign and may precede the rise in blood pressure and oedema by some weeks. Albuminuria is usually the last sign to appear. A gain of over five pounds in any one month should be regarded as excessive.

The difficult case for diagnosis is the one in which the patient is examined at about the twentieth week of pregnancy with raised blood pressure with or without albuminuria. The differential diagnosis here is between preeclampsia, renal insufficiency and essential hypertension. It is my custom to admit these patients to hospital and carry out the following investigations. (i) Microscopic examination of the urine. Red cells and hyaline and granular casts are suggestive of renal damage. (ii) Urea clearance test (concentration plus volume). The normally functioning kidney during pregnancy will return in three hours 5.8 grammes of the 15 grammes of urea given. A return of below 5.0 grammes is suggestive of renal damage. (iii) The clearance of urea from the blood in two hours after 15 grammes of urea have been given by mouth. The result is expressed in percentages; 70% of average normal function is satisfactory; below 60% is strongly suggestive of renal damage. The urea clearance and Fowweather test may give conflicting results. Repeat the test or take most notice of the amount of urea recovered from the urine.

The differential diagnosis is, I believe, important, as the management of the two conditions, preeclampsia and renal insufficiency, is entirely different in many cases.

If the patient is a *primipara* and the diagnosis is renal damage, every effort is made to give her a living child, providing she is prepared to accept the risks inherent in continuation of pregnancy.

In spite of the above-mentioned tests an accurate diagnosis may not be possible; but they are the most reliable we have at our disposal, and in the majority of cases give reliable information. General medical examination, particularly of the *fundus oculorum*, may help to clinch the diagnosis.

Treatment.

Preeclampsia is not a preventable condition, but it is, I believe, a treatable condition provided the diagnosis is made early and the necessary treatment is enforced.

Excessive gain in weight after the twentieth week demands treatment. The pregnant woman is often a gross eater, so the total amount should be reduced. Starchy foods, such as bread, potatoes, cakes, biscuits *et cetera*, are eliminated or kept to a minimum. The protein intake is kept high, and the diet should be salt-free or contain as little salt as possible. Sodium substitutes are available, but are unpalatable to many women. Three meals only are taken. The accessory factors, calcium and the vitamins are given. Thyroid, gradually increased to a maximum tolerance dose, is often used. Ammonium chloride, 30 grains twice a day, is useful, particularly if the patient shows signs of clinical oedema.

TABLE I.
Incidence of Eclampsia in "Booked" Cases.

Place.	Years.	Number of "Booked" Patients.	Number of Cases of Eclampsia.	Incidence.
Brisbane ...	1946 to 1950	11,898	23	1 in 517
Melbourne ...	1946 to 1950	23,944	75	1 in 320
Adelaide ...	1945 to 1950	8446	9	1 in 938
Sydney ...	1936 to 1948	48,111	118	400
Sydney ...	1948 to 1950	15,000	5	1 in 3000
Sydney ...	1950 to 1951	5000	Nil	—

The patient is examined in seven days. A further increase in weight suggests non-cooperation, and the patient should be admitted to hospital.

A rise of 10 points in the diastolic blood pressure without albuminuria is an indication for bed rest, diet restriction and a visit in seven days. A further rise of five points or albuminuria is an indication for admission to hospital.

I am fully aware of the difficulty in getting these patients to hospital, as the hospital where I worked for some years and which should have between 25 and 30 antenatal beds for its annual turnover has in fact 10 such beds. Surely these patients have as much claim to a bed as, for example, those with fractures or chronic illness.

Routine treatment for preeclampsia can be carried out in the average home, but the results do not seem so satisfactory. The treatment of established preeclampsia is standardized along the following lines: (i) bed rest and sedation; (ii) the daily administration of magnesium sulphate; (iii) the giving of a diet consisting of fluids rich in glucose for twenty-four hours, followed by a diet of low salt and high protein content; (iv) the keeping of a fluid balance chart; all specimens of urine should be tested for albumin; (v) the daily administration of 30 grains of ammonium chloride; (vi) the giving of calcium gluconate intravenously or intramuscularly (10 millilitres of a 10% solution); (vii) the occasional use of Lugol's solution; it is said to inactivate the pressor substance from the posterior pituitary body (Coke, 1946); (viii) if the urinary output is unsatisfactory, the intravenous administration of hypertonic glucose solution; in the treatment of the grossly oedematous patient, use 50 milli-

litres of a 50% solution until diuresis occurs, and then follow with 500 millilitres of a 20% solution in water.

Most of these patients improve on this régime, and the early signs of improvement are loss of weight, a satisfactory urinary output followed by less oedema, a fall in blood pressure, and reduction and disappearance of albuminuria. These patients may be discharged from hospital when they have returned to normal, but they must be examined at weekly intervals until delivery, as the toxæmia tends to recur. If improvement does not occur within seven days on this treatment, I believe the pregnancy should be terminated. It does not seem reasonable to expose a woman to the risks of eclampsia, with an 8% to 12% maternal mortality and a 25% to 40% fetal mortality, by trying to carry her on, when by early termination of pregnancy she is exposed to little or no immediate risk and her chance for future successful pregnancies is excellent.

Exceptions to this rule are presented, for example, by the elderly *primipara* or the woman with preexisting hypertensive disease and superadded toxæmia, when the baby is not quite big enough to have a really good chance of survival. The babies need to be about four and a quarter to four and a half pounds in weight, that is, at the thirty-fifth or thirty-sixth week of gestation. The question of kidney damage in prolonged toxæmia I will discuss under prognosis.

The method of termination of pregnancy will, of course, depend on the parity of the patient, on the duration of the pregnancy, and on the severity of the toxæmia. Surgical induction by rupture of the membranes and the administration of "Pitocin" by the drip method has given good results. Cæsarean section has a place in the treatment of the seriously toxæmic *primipara*.

It is held that Cæsarean section is safer for the patient than the development of convulsions. It would perhaps be fair to state that prevention is safer than Cæsarean section.

Pituitrin should never be used for the toxæmic woman. I have seen it precipitate a convulsive seizure. This simple fact is sometimes forgotten.

Prognosis.

The immediate prognosis in preeclamptic toxæmia is good, provided early diagnosis is made and active treatment is carried out. The maternal mortality rate in this series was 0.73% and the fetal mortality rate was 8.9%.

There are conflicting views about the remote prognosis in preeclampsia. Gibberd (1928) and Herrick and Tillman (1936) have stated that in approximately 10% of cases preeclampsia is followed by either hypertensive disease or renal insufficiency. Theobald (1933) states that preeclampsia does not cause permanent vascular hypertension. He bases his opinion on the fact that the deaths from cardio-vascular disease were no more numerous amongst parous than amongst non-parous women. If hypertensive disease does follow preeclampsia, then the woman was a potential hypertensive, the toxæmia simply causing the hypertension to appear at an earlier date.

One finds it hard to believe that a girl of twenty years, who commences her pregnancy with a blood pressure of 120 millimetres of mercury, systolic, and 70 millimetres, diastolic, develops toxæmia and is left with permanent hypertension, would have developed this raised blood pressure in this time in the absence of her pregnancy.

I believe the duration of the toxæmia is an important factor in prognosis. If the toxæmia is not prolonged, recovery is usually complete. If the patient is hypertensive at the commencement of her pregnancy, we are, I believe, on surer grounds. The hypertensive woman is not made worse by pregnancy unless she develops a superadded toxæmia. Approximately 35% of hypertensive women develop toxæmia. The development of toxæmia aggravates the hypertensive disease and usually results in renal damage.

It is not possible in many cases to give a reliable prognosis until at least six months after delivery. The patient should be advised against a further pregnancy for eighteen months to two years, and complete kidney function tests should be carried out before pregnancy is attempted.

Eclampsia.

Eclampsia, I believe, is a preventable condition and is always preceded by signs of preeclampsia, although these signs may be slight and not of long duration.

Again, during the period 1945 to 1950, inclusive, there were 24 cases of eclampsia in 8446 deliveries. Among these 24 cases nine patients were "booked", an incidence of one in 938 for "booked" patients. "Booked" patients attended the antenatal clinic and would correspond to patients in private practice (Table I).

Multiple pregnancy was complicated by eclampsia in one out of 25 cases—a surprisingly high incidence; 83.3% of cases of eclampsia occurred among *primiparae*.

The average age of the *primiparae* was 20.9 years. In a review of interesting facts were obtained.

1. In four cases the convulsive seizures occurred *post partum* and were of mild type, and the patient's condition remained good.

2. In three cases the patients had severe hypertensive disease at the commencement of the pregnancy with superadded toxæmia, and attempts were being made rightly or wrongly to carry on the pregnancy and obtain a living child. The seizures occurred *ante partum* in one case and *intra partum* in two cases.

3. In two cases the seizures occurred *ante partum*, and in both these cases the antenatal care was inadequate.

The first was a girl, aged seventeen years, thirty-two weeks pregnant. Her blood pressure was 135 millimetres of mercury, systolic, and 105 millimetres, diastolic; she had not gained an excessive amount of weight and had no oedema and no albuminuria. Her initial blood pressure had been 130 millimetres of mercury, systolic, and 85 millimetres, diastolic. Because of the shortage of beds I sent her home with the usual instruction on salt-free diet *et cetera* and a sedative and bed rest. Five days later she was admitted to hospital, unconscious, after two seizures. Her blood pressure was 150 millimetres of mercury, systolic, and 110 millimetres, diastolic, and the urine contained "half" albumin.

The second patient was admitted to hospital with a small ante-partum haemorrhage. Her blood pressure was 135 millimetres of mercury, systolic, and 95 millimetres, diastolic. She had oedema but no albuminuria. She was discharged from hospital after seven days and told to report to the ante-natal clinic, but failed to do so. She was admitted to hospital again three weeks later, unconscious, and died undelivered.

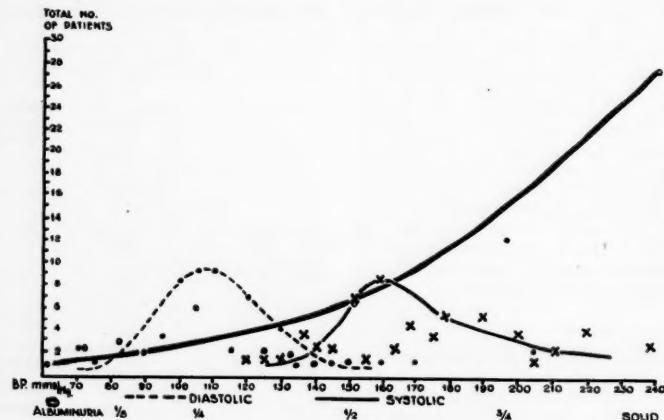


FIGURE I.

Treatment.

The treatment is prevention, by the early diagnosis and active treatment of preeclampsia, which I have already outlined. I would suggest that a critical review of every patient at the twenty-eighth week of her pregnancy should be made from her history card, and that excess weight or rise in blood pressure is an indication for the most rigid supervision and frequent visits during the remainder of the pregnancy.

If during the course of treatment for preeclampsia the blood pressure reaches 160 millimetres of mercury, systolic, and 105 millimetres, diastolic, and the urine contains "half" or more albumin, terminate the pregnancy immediately, as this woman may have convulsions at any time.

Figure I shows the blood pressure and albuminuria at the first fit or on the patient's admission to hospital.

The treatment of established eclampsia varies considerably in detail, but is based on certain definite principles, as follows.

1. Control of the seizures by sedation. My preference is for morphine, with an initial dose of 0.5 grain, followed by 0.25 grain every two hours if the seizures continue at short intervals, provided that the respirations do not fall below 12 per minute, and the maximum dosage is two grains in twenty-four hours. Magnesium sulphate is used extensively in conjunction with morphine, either 20 millilitres of a 20% solution given intravenously or 40 millilitres of a 20% solution given intramuscularly every four to six hours, and with it the dosage of morphine can be reduced. I must admit being a little afraid of magnesium sulphate in spite of its extensive use, and I would suggest that it is unwise to use it if the reflexes are absent and the urinary excretion is poor. Calcium gluconate given intravenously lessens the toxicity of magnesium sulphate. Sodium phenobarbital can be given intramuscularly if the patient is very restless with morphine, but again I confess to some diffidence in mixing sedative drugs.

2. Increasing of the urinary secretion. If the patient is grossly oedematous and the output is low, give 50 millilitres of a 50% glucose solution intravenously. This will improve the output. It is followed by 500 millilitres of 20% glucose solution in water every twelve hours until a satisfactory output is obtained—for example, two ounces per hour. Calcium gluconate (10 millilitres of a 10% solution) is added to the drip fluid.

3. The insertion of a self-retaining catheter. A fluid balance chart should be kept and all specimens tested for albumin.

4. Continuous oxygen therapy and clearing of the airway.

5. Prevention of injury and general nursing measures.

6. Termination of pregnancy. If the response to treatment is good, as shown by cessation of convulsions, good urinary output and return to consciousness, labour is induced twenty-four hours after the seizures have been controlled, by rupture of the membranes. If the response is poor after fourteen to eighteen hours' treatment, the membranes should be ruptured.

Cæsarean section, I believe, has a very limited place in the treatment of eclampsia and is indicated only by some added complications. The indications, I suggest, are as follows: (i) disproportion; (ii) a long, hard, closed cervix and little response to treatment in a primipara; these are bad patients for induction of labour; (iii) prolonged first stage with deterioration of the general condition of the patient; (iv) severe ante-partum haemorrhage; (v) cerebral haemorrhage, with the patient not in labour and the baby alive; (vi) delivery regarded as hopeless with a live baby.

The treatment I have used over the years has been rather stereotyped, so that I have had no experience with *veratrum viride*, recently favourably reported on by Irving, of Boston, who produced figures of a 6.2% maternal mortality from 32 cases.

When I was in America, Hingson at the Johns Hopkins Hospital was using splanchnic block. I have not seen any published results.

Prognosis.

In this series the immediate mortality rates were as follows: maternal, 8.3%; foetal, 22.2%.

With regard to remote prognosis, my experience does not agree with the statement that "once an eclamptic, always a toxæmic", unless there was preexisting hypertensive disease at the commencement of the pregnancy. In the great majority of cases those who survive recover completely and pass through succeeding pregnancies without any trouble. If the patient is left with severe hypertensive disease, little or no renal damage and no living children, there may be a place for the Smithwick type of operation.

I recently attended a girl, aged twenty-one years, who had eclampsia with her first two pregnancies and was left with a residual blood pressure of 190 millimetres of mercury, systolic, and 130 millimetres, diastolic. She was operated on by Dr. L. C. E. Lindon, and became pregnant again three months after operation. Her blood pressure did not rise above 130 millimetres of mercury, systolic, and 85 millimetres, diastolic, during her pregnancy, and she was normally delivered of a living child.

A woman who has had eclampsia should not become pregnant for at least two years, and then only if kidney function tests give results within normal limits. No definite prognosis is given for at least six months, as renal function tests performed soon after eclampsia may be misleading and at this stage suggest permanent renal damage. Further examination from three to six months may reveal perfectly normal renal function.

Conclusion.

In conclusion let me express the hope that this discussion tonight will eliminate eclampsia in Adelaide. The results which Dr. T. Dixon Hughes and his colleagues have achieved at the Women's Hospital, Crown Street, Sydney, should be an inspiration to us all.

Acknowledgement.

My thanks are due to Dr. T. Dixon Hughes for permission to use Table I, showing the incidence of eclampsia.

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Reports of Cases.

STREPTOTHRIX INFECTION OF THE INFERIOR LACHRYMAL CANALICULUS.

By R. HERTZBERG, F.R.A.C.S.,
Sydney.

STREPTOTHRIX infections of the eye are not commonly seen, although resistant conjunctivitis may be due to undiagnosed streptothrix infection. The infection is almost invariably unilateral and should be suspected as a cause of any unilateral conjunctivitis (Berens, 1949).

Involvement of the lower canalculus is most commonly described as consisting of a firm lump in the lower lid on the medial side of the lachrymal punctum (Brinckeroff, 1942).

A typical case of streptothrix infection is recorded below.

Clinical Record.

Mrs. D., aged sixty-five years, was referred to me by Dr. M. Henry, with an infected left eye and a provisional diagnosis of left dacryocystitis. The patient stated that the left eye had been red and discharging pus for approximately three months. For the same time there had been a lump on the lower lid. She had been using penicillin drops (2000 units per millilitre), but without response.

Examination of the patient revealed conjunctival injection with some mucopurulent discharge and some degree of epiphora. On the lower lid medial to the lower punctum was a hard nodule about one centimetre in diameter. The lid was injected. By placing a spatula into the lower fornix behind the mass, pressure could be exerted over it, and in so doing a number of hard concretions "popped" out of the punctum. These were immediately collected and examined by direct smear and culture. The lower canalculus and sac were then copiously irrigated with mercurochrome (1% solution). The patient was given sulphacetamide drops (30%) to be used every two hours.

When she was examined three days later the mass was much smaller, the conjunctiva was less injected and the discharge was scanty. Pressure over the mass expressed numerous concretions, and the canalculus and sac were irrigated with penicillin solution (100,000 units per millilitre). The procedure was repeated after forty-eight hours, but on this occasion concretions could not be expressed. The irrigation was repeated again after forty-eight hours. The mass and infection had now completely subsided. The patient was examined eight weeks later; there had been no recurrence.

The report by Dr. C. B. Cox on the examination of a smear and culture of the concretions was as follows:

Numerous pus cells and red cells are present together with an abundance of branching, filamentous bacteria. Anaerobic culture produced a growth of Streptothrix (*Actinomyces bovis*) after 48 hours' incubation. Growth of the organism is inhibited by all four of the antibiotics tested, viz., penicillin, streptomycin, aureomycin and chloramphenicol.

Discussion.

Theodore (1950) describes the manifestations of the streptothrix infections of the eye and reports a case of follicular conjunctivitis caused by streptothrix harboured in the tear sac. He divides the infections into three types, of which two are as follows: bulbar, with nodules in the bulbar conjunctiva; palpebral conjunctivitis, with involvement of the canaliculari. The infection in the canaliculari may be mistaken for chalazia, styes or infected sebaceous cysts. These occur predominantly in women and involve the upper canaliculari independently or the lower canaliculari also in one-third of cases. In his opinion a unilateral swelling in the upper lid in women should focus attention on the puncta. If concretions are expressed, then the diagnosis is certain. Theodore's third type comprises those cases in which there is conjunctival infection but the canaliculari appear normal.

The most important factor in treatment is mechanical expression of the concretions and copious irrigation of the sac. Local application of drops into the conjunctival sac will leave the infection in the canaliculari and sac uninhibited.

Theodore recommends curetting the canaliculari; however, the concretions can be removed by expression provided the punctum has been dilated first. As the organism is penicillin-sensitive, irrigation of the canaliculari and sac with penicillin will act both mechanically and as an antibiotic. The irrigation should be carried out on several occasions and the patient reviewed after a suitable interval to be certain that the cure has been complete.

Summary.

A case of streptothrix infection of the inferior lachrymal canalculus is described.

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Reviews.

THE NEUROSES.

WALTER C. ALVAREZ, Emeritus Professor of Medicine at the Mayo Foundation, already well known by his "Nervousness, Indigestion and Pain", has written a new work, "The Neuroses", with the object of helping the general physician to differentiate functional and organic and to treat the large proportion of patients whose symptoms arise from "worries, strains and life problems". To convince a patient that his trouble is a neurosis rather than an organic disorder often needs all the skill, tact and common sense that the physician can command. With his many years of experience at the Mayo Clinic Alvarez has been impressed with the need for looking for the tragedies which so many of the patients have suffered. "What's on your mind" should be the next approach to a sheaf of "negative" reports. Special chapters are devoted to symptoms relative to the various visceral systems. Migraine and its variants, and "small strokes" tend to be overlooked as factors in the production of neurotic symptoms. The book is a collection of human documents rather than a text-book—"the squanderer of emotion and energy", "the perfectionist", "the patient with disturbing relatives". Alvarez shows how much can be done by his human approach, which reminds one of the method of the late T. A. Ross to whose work "The Common Neuroses" the author makes several references. Alvarez does not hesitate to castigate the errors, if not delinquencies, in medical prac-

¹ "The Neuroses: Diagnosis and Management of Functional Disorders and Minor Psychoses", by Walter C. Alvarez, M.D.; 1951. Philadelphia and London: W. B. Saunders Company. Melbourne: W. Ramsay (Surgical) Proprietary, Limited. 9 $\frac{1}{2}$ " x 6 $\frac{1}{2}$ ", pp. 678. Price: 95s.

tice, which have come within his lengthy experience. He gives a useful list of "don'ts" for surgeons. In treatment he employs no stereotyped method and he is critical of the extreme psychoanalytical interpretations current in some quarters. He asks how often the unearthing of a psychic shock in childhood works a cure or improves a defective personality. Most of the treatment which he suggests is simple. But he states that *pruritus ani* or *vulva* might be dealt with best by an internist, dermatologist, gynaecologist, proctologist and psychiatrist, all *mirabile dictu* working together. The work is full of shrewd observations and valuable suggestions as to the handling of nervous patients, and one feels that Alvarez is one of those in whom a patient "instinctively" places confidence. The book is commended to the attention of senior students and young graduates; the psychiatrist who is engaging in extramural work after some years of experience in an institution will find the work a most valuable guide.

HEALTH VISITORS.

THERE is a distinction to be drawn between a health visitor and an almoner. In England, at any rate, this applies—the health visitor's duties are primarily related to the carrying out of medical treatment, while those of the almoner are concerned with the use of available social services. The training of health visitors is covered by a special course, distinct from the nurses' and the almoners' courses, but sharing in some of the subjects. Dr. L. Roberts and his colleagues have compiled the "Textbook for Health Visitors" for "young students" studying for the examination for health visitors.

The range of topics makes the book rather a mixed bag. Perhaps it would be wise to drop some of the material. Compressed discourses on such topics as heredity, the Rh factor, immunity, vitamins, and the anatomy and physiology of the special senses are rarely well done in small books. If it is really necessary for health visitors to know those subjects and some of the other "academic" items, a longer and more thorough course of study would seem proper. It is hard to make science easy.

For present-day English conditions no doubt the bulk of the book serves well the purpose for which it has been written. Features of central and local government, vital statistics, care of mother and child, school health, the national health scheme and social security are suitably outlined. The syllabus of the work required for the health visitors' certificate, issued by the Royal Sanitary Institute, illustrates the wide range of information the student is expected to absorb.

For the general practical aspects of the work of the health visitor, the book appears to be a sound and helpful guide. This most recent of medicine's ancillary professions has become, in England, an accepted part of the National Health Service. In Australia and some other countries the development of this British service must continue to hold an interest—and perhaps give us concern.

THE PLANT KINGDOM AND MEDICINE.

THE daily lives of most civilized people have no direct contact with soil and plants, and consequently many people have no realization of the extent of their dependence for life on the plant kingdom. Some perhaps are apt to look upon the botanist as one of the lesser important scientists in the community. In a fascinating handbook "Medical Botany",¹ by Alexander Nelson, which is a companion volume to "Introductory Botany" (1950) by the same author, we are reminded by the wealth of information contained therein, that plants are directly or indirectly responsible for all our food. Furthermore, it is evident that despite the remarkable achievements of the synthetic drug industry, plants still supply mankind with by far the most numerous and important drugs.

¹ "Textbook for Health Visitors", by Llywelyn Roberts, M.D., M.R.C.P., D.P.H., I. G. Davies, M.D., M.R.C.P., D.P.H., and Beryl D. Corner, M.D., M.R.C.P.; 1951. London: Baillière, Tindall and Cox. 8" x 5", pp. 558, with seven plates and 38 figures. Price: 21s.

² "Medical Botany: A Hand-book for Medical Men and all who are Concerned in the Use of Plants: Nutritionists, Dieticians, Pharmacists and Veterinarians", by Alexander Nelson, Ph.D., D.Sc., F.R.S.E.; 1951. Edinburgh: E. and S. Livingstone, Limited. 8¹/₂" x 6", pp. 566, with 16 plates and 13 text figures. Price: 30s.

On reading "Medical Botany" one is bewildered by the enormous variety of substances in the "chemical anatomy" of plants, with so many different nutritive, pharmacological and toxicological properties. Through the ages a vast knowledge concerning plant products has accumulated. Until comparatively recently this knowledge was purely empirical, but modern biochemistry and experimental methods have rationalized and tested these products, confirming and extending the value of some, and discarding others found to be worthless, as well as adding valuable new ones such as penicillin and aureomycin.

One of the problems of modern education which has been created by the great amount of accumulated knowledge, is the task of widening the understanding of the specialist. For the doctor, nutritionist, pharmacist, or veterinarian, "Medical Botany" provides much valuable background material in a very readable form, which will assist in deeper appreciation of the food and drugs he prescribes, and in a realization of "how botany, by impact on our health and well-being, enters into our daily lives". It can be read with full understanding by those with very little knowledge of formal botany.

The author has given due emphasis to plants as sources of food by devoting two-thirds of the book to foodstuffs and their characteristics. The remaining third consists of a section of pharmaceutical interest, and one dealing with plants as positive causes of disease—which includes a discussion of the common plant allergens. The book is up to date and mentions, for instance, the recently discovered growth-stimulating properties of aureomycin. It is well printed in large type, well bound and illustrated.

A MODERN TRANSLATION OF HIPPOCRATIC WRITINGS.

A DISTINGUISHED classical scholar from Cambridge University and a consulting physician of London have combined their intellectual abilities with good effect in order to give a readable and trustworthy English translation of the medical works of Hippocrates.² The translators, Mr. John Chadwick, M.A., and Dr. W. N. Mann, remind us that a long line of editors and scholars have laboured to make available to students of medicine throughout the centuries the writings of the foremost physician of antiquity. Many are familiar with several admirable renderings of selected books from the *Corpus Hippocraticum* published within the last century. First and foremost is the admirable work of Francis Adams, the general practitioner from Banchory in Aberdeenshire, who made his translation for the Sydenham Society in 1849, and long afterwards followed translations by W. H. S. Jones and E. T. Withington for the Loeb Classical Library (1923), and extracts from the Hippocratic writings included by Arthur J. Brock in his translations from ancient medical authors six years later. The full commentaries inserted by Brock in elucidation of the abstruse philosophical and scientific concepts of the ancient Greek medical authors have not been excelled; and it seems a pity that the same plan has not been more fully exploited in this translation.

This book should prove a distinct acquisition to medical literature and history by reason of a strict adherence to the sense of the original Greek text, the fluency of expression conveyed in phrases of modern English usage, and the inclusion of "Coan Prognosis" which now appears for the first time in its complete form. One sentence from the text of "Airs, Waters and Places" provides an example of the leaning to modern idiom: "It is a general rule that men with weak heads are not great drinkers because they are particularly liable to hangovers."

Claudius Galen, the medical dictator and historian, who studied, synthesized and advanced the knowledge of his Greek predecessors in the second century of the Christian era, looked upon them as "the ancients", and referred to Hippocrates as "our leader in everything that is of good repute". To the modern physician the father of medicine is the founder of a revolutionary outlook on the art, science and philosophy of medicine which had its origin in the Aegean world over 2500 years ago. An Ionian philosopher was able to predict an eclipse of the sun, which occurred in 583 B.C., and this astronomical observation seemed to prove that like phenomena were produced in accordance with fixed natural laws rather than by divine interference. Hippocrates never lost faith in spiritual values, but he

² "The Medical Works of Hippocrates", by John Chadwick, M.A. (Cantab.), and W. N. Mann, M.D. (Lond.), F.R.C.P.; 1950. Oxford: Blackwell Scientific Publications, Limited. 8¹/₂" x 5", pp. 316. Price: 20s.

insisted that no one disease was any more sacred or divine than any other, and that all diseases had specific characteristics and a definite cause; in seeking an explanation of disease processes we must look to Nature, to the organism itself and to its environment.

But he carried his thesis still further; he held that the physician in all his professional relations must be guided by the divine nature within him, which would be reflected in a proper attitude to his art, in moral rectitude and intellectual honesty.

In this strange world of shifting spiritual values, medicine is still based largely upon the teachings of the fifth century B.C., and the wisest way to become imbued with the traditions and thought of the great innovators of this period is to make a careful study of their writings.

BRAIN METABOLISM AND CEREBRAL DISORDERS.

IN "Brain Metabolism and Cerebral Disorders" Dr. Harold E. Himwich has given a survey of recent investigations into the biochemistry of cerebral functions.¹ The researches of the author and his co-workers published in some fifty-three of over a thousand papers listed at the end of the book, have for the most part been based on the application of A. Meyerson's technique for obtaining blood from the internal jugular vein and the internal carotid artery whereby oxygen exchange in the brain can be measured. Investigations show that the oxygen consumption in the cerebral tissues is derived from glucose, and from lactic and pyruvic acids. In hypoglycæmia the brain continues to use glucose derived from cerebral glycogen, from hepatic glucose and from glucose saved through the reduction of glucose-fat changes in non-nervous tissues. From the Embden-Meyerhof scheme shown on page 69 it would appear that oxidation of carbohydrate takes place in two stages in the cell, the first anaerobic starting with glycogen and ending with pyruvic acid, and the second with further oxidation to carbon dioxide and water. Experiments with tissues as well as with living animals indicate that in the brain oxygen is used also in the first stage of carbohydrate metabolism. In normal cerebral metabolism 46 to 53 millilitres of oxygen are used up per minute, comprising 20% of the total oxygen consumption in the resting individual. The author found no departure from this norm in schizophrenics and depressives, but noted a drop during hypoglycæmia and also in some cases during the first few weeks after lobotomy. Fever therapy stimulates cerebral metabolism, which is depressed during sedation. Curiously enough the cerebral metabolic rate was found to be raised during thyroid medication in cretinism and myxedema, but not in hyperthyroidism. Convulsion therapy causes cerebral anoxia through interference with respiration and by raising the demand for oxygen in the muscles beyond the supply. Workers in the specialized field of the biochemistry of the cerebrum will find this work of reference indispensable.

PÆDIATRIC ALLERGY.

"PEDIATRIC ALLERGY", by Dr. Robert Chobot, of New York, who is a leading authority on the subject, is a new book which commands our respect, but serves to illustrate the inadequacy of our present concepts of allergy and its detection.² We are indebted to the author for a clear description of the difficulties encountered and the techniques developed for the diagnosis and treatment of allergy in children at the important special clinics at some of the big teaching hospitals in New York. He has been wise enough to concentrate on what he has learned from personal experience of local problems, coloured by what he has found acceptable of the theory and practice recorded in medical literature.

The fundamental difficulty is that, though histamine has been demonstrably produced in anaphylaxis, it is not the sole factor, and allergic reactions are believed to depend on the release of some unknown substance produced by the interaction of allergen and antibody. Based on an hereditary constitutional susceptibility, circulating skin-sensitizing antibodies, blocking antibodies, smooth muscle-sensitizing antibodies and probably other such foreign contents of the body

¹ "Brain Metabolism and Cerebral Disorders", by Harold E. Himwich, M.D.; 1951. Baltimore: The Williams and Wilkins Company. Sydney: Angus and Robertson, Limited. 9" x 6", pp. 462, with 52 illustrations. Price: £3 4s. 6d.

² "Pediatric Allergy", by Robert Chobot, M.D.; First Edition; 1951. New York: McGraw-Hill Book Company, Incorporated. 8" x 5", pp. 234. Price: \$4.50.

fluids interact spontaneously on multiple shock organs, dynamic or potential, together or successively; or allergy may be induced by applied irritants or infections, though not on the original occasion, but after skin and muscle-sensitizing antibodies and precipitins have developed in the host ready to "shock" on meeting the allergen again. Bacterial allergy partakes of characteristics of both the spontaneous and the induced forms of allergy, but does not belong to either category as no skin-sensitizing antibodies are present and symptoms appear only during the activity of a repeated acute upper respiratory infection. The response to the allergen may be immediate or delayed; when the response is "immediate" and skin-sensitizing antibodies are active, positive reactions to both skin and eye tests can be obtained, and only in those circumstances is skin testing of value; hay fever, asthma caused by inhalants or foods and some of the urticarias are the examples. Aspirin sensitivity is quoted as the exception; the clinical symptoms appear immediately, but results of skin tests are always negative. The mechanism of the delayed type of allergy is completely unknown; results of skin and eye tests are negative and the presence of skin-sensitizing antibodies is not demonstrable. Under this heading we find most of the eczemas, many of the urticarias, migraine, gastro-intestinal allergy, drug allergy and bacterial allergy. In the same subject we may find sensitivity, say, to pollens with an immediate response and positive skin reaction and also, say, a food sensitivity with a delayed response and no skin reaction. The negativity of the result of the skin test is no justification for failing to recognize clinical symptoms indicative of an allergic response.

It is not uncharitable, therefore, to describe the basis of the matter as almost entirely unsatisfactory from the scientific aspect and the known facts as insufficient for reliable diagnosis or assured therapy. As the subject matter of the book expands, we find what we would expect to find—that it is necessary to use empirical diagnostic methods and some unreliable therapeutic procedures. It is not the fault of the author; insufficient is known in this large and important field; but doctors the world over have to manage the patients with all their resources of plausibility and the skilful application of the healing art. The description of how it is done in New York will be extremely helpful to others, and carries the conviction that Dr. Chobot and his colleagues know almost all that is to be known of the art and science of allergy and are as likely as any other team to advance the real knowledge of the subject; they are to be admired for their pertinacity, frankness and courage.

Books Received.

[The mention of a book in this column does not imply that no review will appear in a subsequent issue.]

"Color Atlas of Pathology: Hematopoietic System, Reticulo-Endothelial System, Respiratory Tract, Cardiovascular System, Liver, Alimentary Tract, Kidney and Urinary Tract, Musculo-skeletal System", prepared under the auspices of the U.S. Naval Medical School of the National Naval Medical Center, Bethesda, Maryland; 1951. Philadelphia: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 10" x 7 1/2", pp. 558, with 1053 illustrations. Price: £10 9s.

The material used has come from United States Navy and Army sources and also from the Johns Hopkins Hospital and the Georgetown University Medical School.

"Epitome of the Pharmacopeia of the United States and the National Formulary with Comments", issued under the direction and supervision of the Council on Pharmacy and Chemistry of the American Medical Association; Ninth Edition; 1951. Philadelphia: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 7 1/2" x 5", pp. 267. Price: 27s.

One of several volumes on drug therapy published and revised from time to time by the Council on Pharmacy and Chemistry of the American Medical Association.

"Encyclopedia of the Eye: Diagnosis and Treatment", by Conrad Berens, M.D., F.A.C.S., and Edward Siegel, M.A., M.D. Philadelphia: J. B. Lippincott Company. Sydney: Angus and Robertson, Limited. 8" x 5", pp. 278, with 76 illustrations. Price: 53s. 9d.

Intended for "physicians, medical students, nurses and social workers, as well as ophthalmologists and for optometrists".

The Medical Journal of Australia

SATURDAY, SEPTEMBER 29, 1951.

All articles submitted for publication in this journal should be typed with double or treble spacing. Carbon copies should not be sent. Authors are requested to avoid the use of abbreviations and not to underline either words or phrases.

References to articles and books should be carefully checked. In a reference the following information should be given without abbreviation: surname of author, initials of author, year, full title of article, name of journal without abbreviation, volume, number of first page of the article. If a reference is made to an abstract of a paper, the name of the original journal, together with that of the journal in which the abstract has appeared, should be given with full date in each instance.

Authors who are not accustomed to preparing drawings or photographic prints for reproduction are invited to seek the advice of the Editor.

THE HEALTH OF UNIVERSITY STUDENTS.

CONSIDERED INTEREST in the health of university students is a comparatively recent innovation. In places overseas it has been developing for years, in others it is neglected or just starting. In Australia, with the notable exception of Adelaide, almost nothing of a practical nature has been done officially; some action has been taken on the student level. It is clear, of course, that any approach to the problem will differ materially from place to place; as a notable example, a largely residential university or one whose students are mainly living in hostels and lodgings may have a much more obvious call for some type of medical service than the university largely attended by students living at home—the common Australian pattern. Nevertheless it is felt by many that the large body of young men and women congregated in a university, with their potential importance to the community and their own occupational hazards (for these must be recognized), offer a challenge that cannot be ignored by a community claiming to be health conscious. Some idea of what has gone on in Australia and overseas along these lines can be obtained from the paper published in this issue by H. C. Giese, Commonwealth National Fitness Officer. The facts that he presents and his suggestions for the progressive development of health services in Australian universities should be carefully studied. The points raised are of importance, not only from the point of view of student welfare, but also because of their place in the broader questions of present-day developments in community and national health services.

It may be of interest at this stage to examine in a little detail some of the published reports issuing from experience with student health services in Great Britain. One of the oldest of these services has been working successfully in the University of Edinburgh for over twenty years. According to R. E. Verney and R. F. Robertson,¹ it provides, amongst other things, for voluntary

routine medical examination with appropriate advice for all students at the beginning of their course and once a year thereafter, for consultative and domiciliary medical service (mostly, it would seem, for students in lodgings and hostels) and for admission to a special students' ward in the Royal Edinburgh Infirmary when necessary. One of the most important parts of the scheme, and the one most applicable to such universities as our own, is the routine medical examination. Its value in the Edinburgh scheme can be seen from the following points mentioned by Verney and Robertson: healthy students are assured of their fitness and are encouraged to maintain this and to join in the physical and social activities of the university; students with minor physical ailments (about 27%) are put on the way to having these remedied; students with major physical disorders (nearly 2%) are fully investigated, and consideration is given to the advisability of their continuing in the chosen faculty; students with psychological difficulties (7%) are helped to adjust these (often with complete success) or are referred to a psychiatrist. Thus a considerable emphasis is placed on becoming fit and maintaining health. The importance of this type of preventive medicine and positive health service receives further emphasis from an investigation into mortality and prolonged illness among Oxford undergraduates carried out by R. W. Parnell,¹ who is physician in charge of the student health service at the Institute of Social Medicine, Oxford. The figures, though to some extent incomplete, give a broad picture that is illuminating and rather disturbing. Parnell obtained information from 26 colleges and halls about undergraduates' mortality and prolonged illness in 1947, 1948 and 1949. The total population annually at risk was 6142 (5048 men and 1094 women). There were 35 deaths (33 among men, two among women); 17 were due to accidents (six on the roads, four in mountaineering, three by drowning), nine to suicide (all among men), two to poliomyelitis, one to tuberculosis and six to other causes. The annual Oxford undergraduate death rate was 119% of that of the corresponding general age group in England and Wales in 1947. The most striking feature was the undergraduate suicide rate. Comparisons must be treated with caution, as there were only nine suicides in three years; nevertheless, the suicide rate among undergraduates was 11 times that of the general civilian age group and 17 times that of the same age group in the armed forces. Moreover, the rate was far higher even than that for the social class group to which undergraduates broadly belong. One possible factor in this is difficulty of readjustment on the part of ex-servicemen, but this is only a partial explanation, and Parnell quotes relevant pre-war figures from a number of leading universities in the United States of America, where the importance of suicide amongst students was recognized long before the second world war.

During the three-years period under review by Parnell, 145 undergraduates lost one full term's residence on account of illness. Mental illness and nervous breakdown accounted for 52.5% of the total, tuberculosis (of a serious nature) for 23%. Of the 76 students with mental illness, 49 returned to college, 16 went down without a degree, not to return, 11 went down with an undecided future.

¹ *The Lancet*, August 14, 1948.

² *Ibidem*, March 31, 1951.

It is thought, with good reason, that the general morbidity figures fall short of the truth. Parnell estimates that not less than 0.5% and probably nearer 1% of the undergraduate population in residence each year at Oxford suffers from some serious form of mental illness or nervous breakdown. It is the principal cause of prolonged illness. Parnell makes little comment on the underlying causes of mental disturbance in the student class, but certain factors spring to mind—the mental activity and sometimes instability of the intellectual type; the restlessness and half-suppressed sexual urges of the adolescent; the wrestling of serious-minded youth with social and other problems as it learns (often with a shock) of the world's sorry disorder; the effect of heavy and often badly organized study, especially when the student's economic circumstances add to the sense of pressure and urgency. In large measure these factors must be accepted, and they should all be taken into account in any attempted measures to lessen mental illness or breakdown. Parnell suggests that preventive measures need not and should not be directed too much to individuals. "They should not involve healthy young men in routine psycho-analysis, nor need they, in a popular but ugly phrase, 'stir up the mud' unnecessarily. They need not provoke hypochondria or encourage introspection, nor need they sap self-reliance or engender a feeble and dependent state of mind." He mentions the possible value of close tutorial supervision, with attention to early signs of mental staleness and cumulative fatigue, better instruction in mental hygiene and advice on the optimum hours of work, and the desirability of having available for consultation a medical practitioner, perhaps a psychiatrist, well versed in college life. It will be of interest to read of future developments if Parnell succeeds in effecting something along these lines at Oxford.

Meantime the problem warrants attention in our Australian universities, where its details and its solution must be worked out according to local conditions. We do not know, of course, that any problem of mental illness exists here comparable to that suggested by Parnell in his Oxford report. The view has been expressed by a senior university teacher closely interested in student welfare that too much has been said about the nervous strain allegedly attached to study and examinations and that a danger exists of "conditioning" students to the possibility of "nervous breakdowns". This may be so and would bear further consideration. However, the ready availability to students of a medical adviser of the right type, who is thoroughly familiar with the current details of university life and student environment, cannot be anything but helpful in this direction. So far as physical health is concerned, some interesting facts are quoted in an unpublished report on the student health service in the University of Adelaide prepared in April, 1951, by B. F. G. Apps, senior lecturer in charge of the department of physical education in the University of Adelaide. Among the instances of active disease detected in voluntary examinations of students were cases of active tuberculosis, carcinoma of the caecum, acute appendicitis, heavy albuminuria, undescended testicle, undescended testicle and hernia, and *retinitis pigmentosa*. These findings and others for which students were referred on for further investigation or treatment prompted the Student Health

Service Committee to recommend to the University Council that a compulsory medical examination for "freshers" be instituted. The Committee, which came into being in 1946, had taken over and been building on the foundation of voluntary medical examination schemes starting as far back as 1937 and latterly working under a limited organization. It had made available for all students, on a voluntary basis, a general examination, a Mantoux test and a chest X-ray examination, as well as offering advice and taking action in other matters affecting student health. The necessary vision and continued support, Mr. Apps states, was provided by Dr. D. R. W. Cowan, Dr. Helen Mayo and the late Dr. F. S. Hone. The recommendation for compulsory examination of all "freshers" was a major step to take, but it was agreed to by the University Council. All full-time students in their first year at the University of Adelaide are now required to have, before the beginning of the third term, a medical examination, Mantoux test and X-ray examination of the chest, either by their own doctor or by the Union Health Service—that is, the service within the University, which is organized and financed by the Union, and for which there is no direct charge to the student (though he pays indirectly through his Union fee). This puts the University of Adelaide far ahead of any other in Australia. Indeed, the only activity in the other universities (though this at least is common to all) is an examination for the detection of tuberculosis organized in nearly every case by the students themselves. With medical schools in four universities and one projected in a fifth, this is surprising and even depressing. In the words of Professor A. A. Abbie,¹ after he had drawn attention to the advanced development observed by him of student health services in the United States of America: "Such a facility should be a part of every Australian university. It is a lasting reproach that the supposed source of medical enlightenment should be almost completely indifferent to the well-being of the members of its own community." It seems right to suggest also that the matter should be receiving the attention not only of the university authorities, especially those of the medical schools, but also of the British Medical Association. It touches both of the Association's objects. It has a significant place in the promotion of medical science, and it bears on the furtherance of the welfare and interests of the profession, particularly in its relation to the development of a national health scheme. Indeed, it is known that when the subject was brought before the Australian Vice-Chancellor's Conference, interest was shown, but it was felt that no action should be taken by the vice-chancellors until the national health scheme, which was under discussion in the Commonwealth Parliament at the time, came into being. In the conclusion to his paper Giese suggests a small committee, representative of the Universities Commission of the Commonwealth Office of Education, the Commonwealth Department of Health, the National Union of University Students, and the Vice-Chancellors' Conference, to investigate the services already operating in Australian universities and to plan for the future. Such a committee would be incomplete without a representative of the British Medical Association, and the Federal Council might do well to take some positive and constructive action on the subject.

Current Comment.

PHYSICAL EXERCISE IN HEALTH.

Most medical practitioners are consulted from time to time about physical exercise, its value, its possible harmfulness and so on. Their general knowledge of physiology and pathology with the aid of common sense and personal experience will answer many questions, but they must often look for some more detailed statement on the subject to supplement their own ideas. Such a statement will be found in the Lumleian lectures delivered before the Royal College of Physicians by Sir Adolphe Abrahams in April of this year. The first of these,¹ to which we shall confine our attention at present, deals mainly with exercise as it affects the healthy subject. Abrahams points out that in a state of Nature the demand for physical exercise is satisfied as instinctively as the demands imposed by hunger, thirst and cold; the mere circumstances of existence ensure a sufficiency. But in civilized life the amount of necessary physical exertion is greatly reduced and is in many cases negligible. This lack may be overcome because of an instinctive urge or as a deliberately undertaken measure of hygiene, but in any case advice on its right use is often needed. Such advice should take in the psychological as well as the physical aspects—"the exercise that gives unqualified enjoyment to one may inspire boredom in another and be interpreted as a form of torture by a third". Of the value of exercise appropriate to the individual there can, of course, be no doubt. At least in certain more vigorous forms it provides an outlet for the primitive instincts of aggression, turning into conventionalized channels an urge that the civilized world wishes to see less and less expressed in crude fashion. Physical benefits may relate to all functions of the body. The circulation is stimulated, and the increased call on cardiac activity tends to educate the body to deal with emergencies.

Ventilation of the lungs is increased, especially at the apices. The mechanism of temperature control is tuned up; the nervous system is trained in coordination. A higher level of motor integration automatically ensues. Muscular movements are conducted with greater economy. . . . The integrative effect . . . extends deeply into the autonomic field. A sense of strength and well-being engenders, colours, and reacts upon the outlook and actions as a whole.

The bone-marrow is stimulated by temporary oxygen want. The suprarenals reflexly enlarge. The mechanical function of the alimentary canal is stimulated favourably, and this with psychological and other factors benefits appetite and digestive function. These are the beneficial effects of physical activity; but, as Abrahams makes clear, too much must not be claimed. Muscular efficiency or athleticism is one thing, resistance to infection is another, and there is no evidence that the one is associated with, or conducive to, the attainment of the other.

Another subject about which there have been "preposterous misconceptions", Abrahams states, is the use of muscular exertion as an alleged aid to weight reduction. Simple calculation shows that the oxidation of a standard pound of body weight in the form of fat requires normal walking for over 66 miles spread over about nineteen hours, or foxtrotting (dancing) for sixteen hours, or full speed sprinting for seven and one-third miles (an impossible feat), or running at the rate of 10 miles per hour (a good Marathon pace) for 43 miles. Abrahams admits that almost certainly there is some other factor that is more elusive—the figures quoted do not completely reflect the practical facts—but it is much too easy to overstate the reducing value of exercise. It is important in this regard not to confuse loss of fat with loss of weight; a good deal of weight may be lost during exercise from loss of water by perspiration and respiration, but this weight is restored in from one to three days. The relationship of diet to physical fitness and athletic prowess is largely "debunked".

by Abrahams. He sees little virtue in the many ideas that have been held by athletes and others on the subject—"dietetic peculiarities are simply those of individual taste, the dictates of natural inclination". His considered view should help to bolster up the opinion of many practitioners who have felt that their knowledge of physiology did not support extravagant views of the importance particularly of animal protein and vitamins, and who have yet shrunk from the unpopularity that is the lot of the iconoclast.

The relation of the heart to exercise is discussed at some length by Abrahams, with special attention to the possibility of strain and permanent injury following extreme exertion. We need not follow his detailed arguments now, but they are in complete accord with the view now generally held that a healthy heart is not harmed by exercise. The association of cardiac hypertrophy with athleticism, which is sometimes found, may well be a constitutional quality particularly fitting the individual for protracted exertion, and not an abnormal consequence of exercise. On another thorny problem, the desirability of strenuous exercise for women, Abrahams is more cautious. He points out that both the gynaecologists and the obstetricians are divided on the subject, and the psychological aspect of "masculinizing" can be interpreted variously. The question seems still to be undecided. Apart from this, however, Abrahams has much positive advice in his paper which should be read at first hand by those interested. His second lecture, on the pathology of exercise, will be referred to at another time.

COMMONWEALTH COUNCIL FOR NATIONAL FITNESS.

ACCORDING to the report just received of the twelfth session of the Commonwealth Council for National Fitness held at Canberra on December 11, 1950, under the chairmanship of the Director-General of Health, Dr. A. J. Metcalfe, the Council is facing financial difficulty. The main purpose of the meeting was the revision of the existing schedule of expenditure under which the Commonwealth grants had operated since 1946; constantly rising costs and the impossibility of an increase in the Commonwealth grant made an examination of the position imperative. On the other hand the chairman drew attention to the need for making full use of the resources and cooperation of local government and of voluntary organizations in conjunction with State and Commonwealth assistance. The revision of the schedule occasioned much discussion, and financial considerations determined the attitude of the Council to many agenda items. There were, however, other matters of general interest. The 1949 report of the Commonwealth national fitness officers was adopted and led *inter alia* to a resolution that the Council offer through the Department of Immigration to contribute certain services to migrant camps in the form of holiday play centres and school camps for migrant children. In another resolution the Council decided to seek information on the Government's future policy on the administration of the Commonwealth National Fitness Act, 1941, and recommended an extension of activity for several reasons, including the need for health and fitness in the event of war. The most effective contribution in this direction was considered to be the greatly increased development of physical education for youth, particularly through the schools and voluntary health organizations; a suggestion was made for the development of a common plan in all the States. The Council also asked that the chairman arrange for the collection of any information available regarding the physical defects which had led to the rejection of recruits to the services. Reference was made to the development of a full degree course in physical education in at least one of the Australian universities; till this was done, it was stated, physical education training could not reach recognized standards acceptable overseas. However, it was pointed out that existing courses had made a valuable contribution to specialist physical education training in Australia.

¹ *The Lancet*, May 26, 1951.

Abstracts from Medical Literature.

SURGERY.

Sacro-Coccygeal Teratomata in Infants and Children.

ROBERT E. GROSS, H. WILLIAM CLATWORTHY AND IRVING A. MEEKER, JUNIOR (*Surgery, Gynecology and Obstetrics*, March, 1951) describe the clinical problem, the pathological characteristics and the surgical management in cases of sacro-coccygeal teratoma, basing the report on 40 cases studied at the Boston Children's Hospital. The period over which the cases occurred was thirty years, and the follow-up was fairly complete. The authors state that teratomata are composite masses possessing more than one germinal layer, and in many cases tissue representing all three germinal layers was found. A wide range of tissue maturation may be found from case to case and in different portions of one specimen. These tumours may persist as benign cystic or solid structures that grow at about the same rate as the host and cause symptoms only by virtue of size or by displacement of adjacent organs. Conversely, one element may at any time discard its mantle of benignity and burst forth as a rapidly growing tumour which invades nearby structures. These tumours may metastasize widely to lymph nodes, lung or skeleton and bring about the death of the child within a few months. Of the 40 cases reported, in 11 there were histologically malignant characteristics. The authors go on to state that these tumours present a wide variety of gross appearances. They are smooth or irregularly shaped. They range from tiny lesions a few centimetres in diameter to huge ones which may be larger than the baby's head. They may be completely solid, largely cystic or any combination of both. They are situated in the sacral area or buttocks, whence they tend to grow postero-inferiorly to form a large protrusion over the sacral and perineal regions. Many of them tend to dissect antero-superiorly into the hollow of the sacrum and thereby displace and distort regional organs such as the rectum, vagina and buttocks without actually involving them. In two cases the tumour entered the spinal canal and grew upward extradurally as a finger-like projection. Almost always the tumour is attached to the coccyx, and this organ should be removed with the tumour in its total extirpation. Cut surfaces of these teratomata show great variations in structure. Some are largely cystic, others entirely solid; the two forms are commonly intermingled in an irregular way. Some contain hair or sebaceous material, others contain fluid, which is clear, yellow or cloudy. Solid areas may be scirrhouous or soft and highly cellular. Microscopically, all types of tissue have been encountered except cardiac tissue, placental tissue and gonads. Skin, alimentary tract lining, salivary and pancreatic glands, respiratory tract tissues, cartilaginous and osseous formations, smooth and striated muscle and nerve tissues are commonly seen in benign lesions. The authors believe that teratomata arise from primordial

cells which may be pluripotent or totipotent. They state that the great frequency of appearance of teratomata near the coccyx is readily explicable. It is here that the "primitive" knot or Henson's node is finally located, and its totipotent cells are apt to split off and give rise to neoplasms. In the mid-portion of the fetus are the segmented mesoderm, the neural canal, and the developing somites. As the somites and the neural tube develop cephalad, there is a caudal migration of the primitive knot, so that this focus is pushed far out into the developing tail. In a male embryo, the reproductive gland *Anlage* differentiates abruptly at the age of thirty-one to thirty-four days and forms a testis. If an embryo is destined to become female, no changes occur in the reproductive *Anlage* until the age of thirty-nine to fifty days, when the ovary slowly begins to develop. Obviously, genital cells have a shorter time to become ectopic during the brief development of the testis in the male embryo, while in the female the process of ovarian formation is prolonged by five to fifteen days and there is increased chance for aberrations to occur. The authors believe that this mechanism may possibly account for the higher incidences of sacro-coccygeal teratomata in the female subject. Thirty-two of the 40 patients in this series were females. In the differential diagnosis, meningocele, chordoma, ependymoma and pilonidal cysts and sinuses are included. The authors consider that, regardless of the size of the tumour or the small size of the patient, the benefits of surgery should be offered. The details of the technique of a radical attack on the total mass are given. In the series quoted, there was one post-operative death, and in the last ten years no wound infections have occurred. The over-all ultimate mortality rate was 11 out of 40; 29 patients have apparently been free of neoplasm.

A Surgical Approach to Atelectasis in the Newborn Infant.

EDON BERGLUND AND W. P. EDER (*Surgery*, January, 1951) report three cases of atelectasis in infants, in which when other measures failed, thoracotomy and application of pressure through a closely fitting mask inflated the lung. They state that atelectasis of the newborn infant is a well-established clinical and pathological entity. It is associated with prematurity, and the small feeble infant is subject to the impact of independent maintenance of physiological functions before cellular development is adequate. When faulty aeration and resultant hypoxia are added, the prognosis is exceedingly grave. The diagnosis is difficult to establish radiologically, but the clinical picture is usually sufficient to establish it. The disease most frequently occurs in premature, but may occur in full-term, infants. The symptoms may appear immediately after delivery or may not become manifest until several hours later. Cyanosis which develops within a few minutes after the child is removed from an oxygen-enriched atmosphere and which is quickly relieved by oxygen is the most important clinical sign. This is usually accompanied by moderate or severe infrasternal and suprasternal retraction. The treatment has been primarily symptomatic with administration of oxygen and aspiration by direct suction of amniotic content, if

its presence is suspected. Bronchoscopy and direct suction did not help any of the three infants whose case notes are presented. In two of the cases, positive pressure was applied before thoracotomy, but without beneficial results. Thoracotomy apparently assists the pressure to inflate the lung and enables the operator to visualize the lung and therefore determine the degree and duration of pressure to be applied.

Uncommon Umbilical Anomalies in Children.

PAUL F. FOX (*Surgery, Gynecology and Obstetrics*, January, 1951) presents a communication dealing with 15 patients who exhibited a wide variety of umbilical anomalies, both alimentary and urachal, in addition to omphalocele. Alimentary anomalies were as follows: (i) completely patent omphalomesenteric duct; (ii) partially patent omphalomesenteric duct, the patency being of the peripheral portion (umbilical sinus), of the intermediate portion (vitelline cyst) or of the enteric portion (Meckel's diverticulum); (iii) mucosal remnants at the umbilicus (mucosal polypus); (iv) congenital bands. Urachal anomalies were as follows: (i) completely patent urachas (umbilical urinary fistula); (ii) partially patent urachas, the patency being of the peripheral portion (umbilical urachal sinus), of the intermediate portion (urachal cyst) or of the vesical portion. There were four cases of omphalocele or exomphalos. The author states that all these umbilical anomalies should be treated surgically, as the infants withstand surgical intervention well and results are satisfactory in most instances.

Early Surgical Treatment of Tuberculosis of the Hip in Children.

W. M. ROBERTS AND F. S. WEBSTER (*Surgery, Gynecology and Obstetrics*, February, 1951) state that an increase in the incidence of tuberculous infections of the joints was predicted for the years following the war. The number of admissions of patients with this disease into the North Carolina Orthopedic Hospital has borne out this prediction. For tuberculosis of the hip, antibiotics have not been the answer, and the methods of treatment today have not changed greatly from those of former years. The present trend is to bring about ankylosis of the joint by means of surgery. The cure of tuberculosis of the hip with retention of useful motion is rare, and even to await spontaneous fusion through conservative measures is a long and uncertain process. It has been the practice at the North Carolina Orthopedic Hospital to perform early surgical ankylosis since 1927, a custom due to the stimulus of Hibbs. This is carried out as soon as there are signs of localization of the disease, manifested by increased density of the surrounding adjacent bone with a definite demarcation of the surrounding infected area. Also the general clinical response of the patient, such as weight gain, increase in physical activity, improvement in blood picture including a normal or declining sedimentation rate, and normal temperature chart, is evaluated. The authors state that the presence of a warm abscess is a contraindication to surgery, but a localized cold abscess, associated with the pre-

ceding findings, is not prohibitive to grafting. In the authors' cases, the disease generally became quiescent enough to allow an attempt at fusion after one and a half to two years of conservative management. The authors analyse the results in 70 cases in which this treatment has been followed. In general, satisfactory fusion was obtained in 86% of the cases. They state that extraarticular fusion is the method of choice, the Wilson technique having proved to be an exceptionally satisfactory procedure. It is a relatively simple technique performed with a direct lateral approach through a window in the cast, and can be carried out with a minimum of anaesthesia and manipulation. With the necessary support for early weight-bearing provided by the graft, solid ankylosis is the usual result in a period of three years. The age of the patient is not a contraindication to attempted fusion. The average age of the subjects of the first operation in all 70 cases was seven and a half years. Measures which shorten the period of immobilization minimize the chances of great discrepancies in leg length. Subtrochanteric osteotomy can be performed late, if necessary, with determined accuracy and little harm to the children.

Reflux Oesophagitis, Sliding Hiatal Hernia, and the Anatomy of Repair.

P. R. ALLISON (*Surgery, Gynecology and Obstetrics*, April, 1951) reviews the records of 204 patients with diaphragmatic hiatal hernia in a thoracic surgical unit over a five-year period. He discusses the symptoms due to the oesophagitis associated with sliding hiatal hernia—the intense burning pain behind the lower part of the sternum, especially on forward bending, the dry, burning throat, the acute pain at night relieved by sitting upright, and the belching. The endoscopic appearances of oesophagitis and the method of using a Cushing brain clip to indicate the exact area of transition from oesophageal to gastric epithelium are described. The anatomical sphincter, which depends on the lasso-like function of the right diaphragmatic crus, is described, and the action likened to that of the pubo-rectalis about the anorectal junction. The author states that a sliding hiatal hernia occurs posteriorly when the fibres of the crus split to increase the size of the opening, whereas the paraesophageal hernia is a herniation anteriorly into a preformed peritoneal sac. With the sliding hernia, stomach is pulled up into the chest. Incompetence of the cardiac sphincteric mechanism is present, and oesophagitis may result. With the rolling or paraesophageal hernia there is no loss of cardiac sphincteric competency, and reflux oesophagitis does not occur. The technique of repair of a sliding hiatal hernia through a left thoracic approach is given, with details and diagrams and some statistics of the patients treated over five years.

Mesenteric Cysts, Enterocystomata and Omental Cysts.

Sj. G. RINSMA (*Archivum chirurgicum Neerlandicum*, Volume III, Fasciculus 2, 1951) reports ten cases of abdominal cysts with a brief discussion of the history, origin, symptoms, diagnosis and treatment. He distinguishes the following among genuine cysts: (i) Lymphatic cysts, which are genuine

tumours of mesodermal origin. The walls contain dilated lymph vessels, capillaries and lymphoid tissue and occasionally smooth muscular fibres. There may be an inner covering of endothelium, and the contents are serous or chylous or may be of a pulpy consistency. They may be solitary or multiple, unilocular or multilocular, and may occur in the omentum as well as in the mesentery. (ii) Enterocystomata, which are congenital cysts arising from the gastro-intestinal tract. The wall structure resembles that of the intestine. Various theories of origin have been proposed, and some of these cysts develop into reduplications, which may vary from a long tube to a small cyst. The cyst may be in the intestinal wall or lie free with a mesentery of its own. It may communicate with the intestinal lumen by means of one or more openings, and there may be no communication at all. (iii) Cysts arising from remnants of Wolffian duct, Müllerian duct, ovaries or germinal epithelium. (iv) Cysts arising from endometriomata. (v) Simple dermoid cysts. (vi) Parasitic cysts. (vii) Echinococcus cysts. The author goes on to state that pseudocysts include gas cysts, blood cysts, softened cysts (from a casedated lymphatic gland), butter cysts (from a degenerated lipoma) and *hydrops cysticus omenti*. The clinical symptoms depend on the site and size of the cyst, varying from an asymptomatic state to symptoms of ileus, torsion of cyst, haemorrhage, rupture and infection. Diagnosis is frequently possible, X-ray examination with urography and opaque meals being of value. The best treatment is enucleation of the cyst without injury to the intestinal wall. However, on occasions resection of intestine and mesentery is necessary. Of the ten cases reported, six were lymphatic or lymphangiocavernous cysts, one was an enterocystoma, one a mesenteric cyst of unknown origin, one a case of old subserous haemorrhage and one an omental cyst. In five cases enucleation was possible, but in the other five resection of intestine was required, and two deaths resulted.

Cause and Treatment of Pruritus Ani.

C. C. TUCKER (*Archives of Surgery*, March, 1951) discusses the causes of *pruritus ani* under the headings of nervous, endocrine, allergic, mycotic and chemical. He is of the opinion that the great majority of cases are due to a chemical irritation of the skin by the products of meat digestion, for example, the skatoles. He recognizes four stages of the disease: (i) dilatation of the blood and lymph vessels with round-cell infiltration and swelling of the prickle-cell layer (38%); (ii) great proliferation of the epidermis with hyperkeratosis and plugging of the hair follicles (56%); (iii) atrophy of the epidermis and especially of the hair follicles and sebaceous glands (4%); (iv) multiple epithelial defects with excoriations, deep fissures and shallow ulcers (2%). In the author's treatment of the lesion highly seasoned food and all meats are forbidden. The local lesion is kept clean and dry by being washed with soap and water after defaecation and whenever it becomes moist, dried with cotton wool, and swabbed with alcohol and then with compound tincture of benzoin or a dusting powder. A 2%

aqueous solution of brilliant green is the only other preparation applied locally. The author considers that most of the lesions will require some surgical intervention; this entails the correction of any local rectal lesion and then the undercutting of the perianal skin with the patient under local anaesthesia.

Third Ventriculostomy for Obstructive Hydrocephalus in Children.

HAROLD C. VORIS (*A.M.A. Archives of Neurology and Psychiatry*, March, 1951) describes ventriculostomy through the third ventricle by the lateral or temporal approach as a satisfactory method of treatment in certain cases of obstructive hydrocephalus in infancy and early childhood. He states that the procedure should be reserved for patients in whom direct surgical attack on the cause of the hydrocephalus is difficult, and for patients who show no evidence of obstruction of the basilar subarachnoid cisterns. He considers it most suited to patients with obstructive hydrocephalus due to the Arnold-Chiari malformation, which may be accompanied by *spina bifida* and meningocele or myelomeningocele. He describes his experiences chiefly with cases of Arnold-Chiari malformation and states that he has found that exploration of the posterior fossa with suboccipital decompression gave no lasting symptomatic relief. He then tried the lateral approach to the third ventricle as described by Dandy and performed a ventriculostomy through the floor of the third ventricle. This was carried out in ten cases, and the children have been observed for from six months to four years. The results are stated to be excellent.

Pain Below the Level of Injury of the Spinal Cord.

L. J. POLLOCK *et alii* (*A.M.A. Archives of Neurology and Psychiatry*, March, 1951) describe information obtained from 246 patients suffering from spinal cord and *cauda equina* injuries. Intensive studies were carried out on 50 patients as well. The authors describe three types of pain felt by this type of patient: (i) typical root pains and atypical root pains; (ii) visceral or visceral referred pain; (iii) pain occurring distal to the level of the lesion, more often described as a "burning" paresthesia. The authors state that to explain this third type of pain there have been many theories—some involving the sympathetic pathways. They suggest that the site of this pain is the distal end of the segment proximal to the lesion in the cord. In support they quote cases of phantom limbs with burning pain associated with transverse lesions of the cord; spinal anaesthesia below the injury site did not relieve the pain, nor did interruption of sensory impulses below the lesion. Only when spinal anaesthesia was performed above the lesion level did the pain disappear. In the studies on 50 patients with complete physiological cord block, the authors observed that severe injuries to parts innervated by segments below the lesion level produced no pain. These injuries included surgical procedures and operations involving the viscera. From their studies the authors conclude that for both skeletal and visceral symptoms, stimuli producing pain send impulses through the ordinary sensory pathways in the spinal cord.

British Medical Association News.

SCIENTIFIC.

A MEETING of the New South Wales Branch of the British Medical Association was held at the Royal North Shore Hospital of Sydney, Crown's Nest, New South Wales, on June 21, 1951. The meeting took the form of a series of clinical demonstrations by members of the medical and surgical staff of the hospital. Part of this report appeared in the issue of September 22, 1951.

Renal Hypertension and Chronic Nephritis.

DR. JAMES ISBISTER showed a married woman, aged twenty-two years, who at the age of three years had had an illness which was probably acute nephritis. At the age of nine years she had been told by another doctor that she had Bright's disease. She had been first examined at the Royal North Shore Hospital of Sydney during early pregnancy. At that time her blood pressure was found to be slightly raised, and during the pregnancy it had continued to rise, and she developed evidence of toxæmia. She was delivered at the end of nine months; her blood pressure then fell, and for some months remained at about 180 millimetres of mercury, systolic, and 120 millimetres, diastolic. In March, 1951, eight months after the confinement, hexamethonium bromide therapy had been commenced by mouth in small doses and gradually increased as tolerance developed. At the time of the meeting the patient was taking three grammes per day, and her blood pressure averaged 160 millimetres of mercury, systolic, and 110 millimetres, diastolic. Although the diminution in blood pressure was not great, there was subjective improvement in the patient, and it was hoped that the progress of the disease would be delayed.

Dr. Isbister commented that it would appear that hexamethonium bromide affected the type of hypertension encountered in chronic renal disease. Experience in other cases showed that it was useful in controlling hypertensive encephalopathy, acute pulmonary oedema, acute nephritis, and the malignant phase of hypertension in chronic nephritis.

Chorionepithelioma.

DR. OSSIAN ROBERTSON presented a married woman patient, aged twenty years, who had been admitted to the Royal North Shore Hospital of Sydney on March 2, 1951, for an incomplete abortion. She had had no previous pregnancies, serious illnesses or operations. The last menstrual period had commenced on December 18, 1950, and vaginal bleeding had been present for two days before her admission to hospital. On examination of the patient, the bleeding was found to be coming from a small area in the anterior vaginal wall, about half an inch from the vaginal opening. There was a bluish haemato ma about one inch in diameter with a small hole in the centre, from which blood was coming. The cervix was normal, and the uterus was enlarged to the size of a ten weeks' pregnancy. It was thought that the lesion was probably a secondary deposit from a metastasizing hydatidiform mole or chorionepithelioma, but the possibility of trauma could not be excluded. The patient solved the problem herself by expelling a hydatidiform mole on March 4. On March 8 curettage was performed, and pale tissue was digitally expressed from the vaginal haemato ma. Microscopic examination of the aborted mole confirmed the diagnosis and revealed no evidence of malignant change. However, the pathologist reported that the curetted material and the tissue from the vagina were chorionic epithelioma. Because of the gravity of performing a hysterectomy on such a young woman, the specimens were submitted in consultation to two other pathologists. They were both doubtful about the degree of malignant change in the tumour. A feature which cast doubt on whether it was a frank chorionic epithelioma was the formation of some villi in the secondary deposit. It was decided not to perform hysterectomy because, firstly, there was doubt on the part of some of the pathologists, secondly, cases had been reported in the literature in which an apparently metastasizing chorionic tumour had disappeared, and thirdly, after one week the vaginal secondary lesion had completely disappeared. Serial Aschheim-Zondek tests were carried out over a period of about two months. The results in mice with a dilution of 1:50 were at first positive; they became negative after curettage and then gradually positive again. On May 7, 1951, they were positive in mice with dilutions of urine of 1:25 and 1:50. In the toad test the results with undiluted urine were positive throughout the period. In an X-ray film of the chest taken on March 7, 1951, the lungs

and heart appeared to be normal. Another chest X-ray examination on May 1, 1951, showed the presence of secondary deposits in the lungs, and when the original X-ray film was reviewed, round shadows could be seen; these had increased in the second film. It was now decided to operate, because it was thought that, even if the tumour was not of high-grade malignancy, it was still apparently active, and invasive tumours of low-grade malignancy had been known to kill the patient by perforating the uterus. Also, secondary deposits in the lungs had been reported as undergoing complete resolution after removal of the primary lesion in the uterus; as the vaginal metastases had already completely disappeared, that seemed quite a likely possibility in the present case. Total hysterectomy with right salpingo-oophorectomy was performed. The right Fallopian tube and ovary were removed, because the right ovary was more or less completely replaced by cysts with no ovarian tissue remaining. It was not considered advisable to remove the left ovary, because the patient was a very young woman; if the tumour was of very low-grade malignancy it was not likely to recur in the Fallopian tube and ovary, while if it was of very high-grade malignancy the patient was doomed in any case. Post-operative recovery was uneventful. The X-ray appearance of the lungs on May 23 had not changed, and an Aschheim-Zondek test on May 29 yielded a negative result with a 1:25 dilution of urine in a mouse. The result with undiluted urine was faintly positive in both mouse and toad. The pathologist reported that the uterus was slightly enlarged and contained a growth in the fundus. Macroscopically the growth consisted of numerous small vesicles in a semi-necrotic matrix like a hydatidiform mole. Microscopic examination of the growth showed enlarged, oedematous villi and malignant-looking syncytial cells just like those in the slides from the curettage material and vaginal growth. The uterine muscle was being invaded by the growth. In one place there was a group of syncytial cells distending in a small endothelium-lined space, which could be either a lymphatic or a small venule.

Ectopic Pelvic Kidney with Pregnancy.

DR. ROBERTSON's second patient was a married woman, aged twenty-five years, who had been admitted to the Royal North Shore Hospital of Sydney on February 28, 1951, for elective Cesarean section because she had a pelvic kidney. She had two children, now aged four and a half and two years respectively. The birth of the first child had been normal, but that of the second had involved a four-day labour ending in a difficult instrumental delivery. The pelvic kidney had been discovered in May, 1950, when a laparotomy had been performed for a suspected ovarian cyst. At that time the patient was about six weeks pregnant. Dr. Robertson said that a normal living female child, weighing seven pounds thirteen ounces, had been delivered by elective Cesarean section, and the post-operative recovery had been normal. He demonstrated the ectopic kidney in an excretion pyelogram.

Septic Abortion with Oliguria.

DR. A. J. MURRAY discussed the case of a married woman, aged twenty-nine years, who had been admitted to hospital eleven hours after she had attempted to terminate an early pregnancy by syringing herself with a solution of soapy water and castor oil. She had already had seven children, but no previous abortions. Severe lower abdominal pain had immediately followed, and she had fainted for several minutes. Vaginal bleeding had occurred about thirty minutes later. In a few hours haemoptysis had occurred, the material being thick and red at first, and then brown in colour. The abdominal pain and vaginal bleeding had persisted. The patient was very shocked and had air hunger. Rales were audible over both lung fields; there was generalized tenderness in the abdomen, chiefly in the lower part, but no muscular guarding. The fundus of the uterus was palpable about two fingers' breadth below the umbilicus. A transfusion of whole blood and a course of penicillin and sulphonamide therapy were commenced. By next morning her general condition had improved considerably. The administration of dextrose-saline solution was continued. As only five ounces of urine had been obtained in thirty-six hours, the patient was considered to be developing anuria. Sulphonamide therapy was suspended and an anuric diet was instituted, consisting of glucose 400 grammes, maize oil 100 grammes, acacia *quantum sufficit*, and water to one litre. This was administered by means of a Ryle's tube, one litre being given in a slow drip each twenty-four hours. Vomitus was strained and put back down the tube. No other food or fluid was given. The daily quantity of urine passed was measured, and an equivalent volume of water was added to the diet. Gas-gangrene antiserum and streptomycin were

given. The dyspnoea and lung râles were thought to be due to the forcing of some of the douche solution into the uterine veins and its carriage to the lungs. By January 27, despite almost complete anuria, her condition had gradually improved, and on January 28 she commenced to pass a small quantity of urine. By February 5 the output had increased to 15 ounces, and the administration of a light diet was commenced. On February 4 slight muscular twitchings were noted, on February 5 these had increased, and the carbon-dioxide combining power was 24 volumes *per centum*. On February 6 the muscular twitchings were greater, there was hyperpnoea, and the carbon-dioxide combining power was only 10 volumes *per centum*. Ten units of 5M sodium lactate solution were given by intravenous injection. Next day her condition had improved, the twitchings and hyperpnoea being less. The carbon-dioxide combining power was 15 volumes *per centum*, and more sodium lactate solution was given. On February 8 there appeared to be some mental deterioration, and the patient said that she did not want to live. The carbon-dioxide combining power was 26 volumes *per centum*. The daily urine output was now 30 to 40 ounces, and the specific gravity varied from 1012 to 1020. On February 9 her condition had deteriorated further, and at 10 a.m. on February 11 she died.

As it was a coroner's case, a post-mortem examination could not be performed at the hospital, but the Government Medical Officer supplied the following report:

Upper part of uterus necrotic and adherent to small bowel. Thick brown blood in the peritoneal cavity. Fus in the tissue beside the cervix passing up into the left side of the pelvis. Placental remains in uterus. Kidneys large, brown and oedematous. Liver was pale. Lungs were congested and oedematous.

Carcinoma Arising in a Wolffian Duct Remnant.

Dr. Murray then discussed the case of a woman, aged twenty-three years, who had been admitted to hospital in March, 1950. Nine months previously she had received hormone injections for menstrual irregularity, with good effect. For some months before her admission to hospital she had had a vaginal discharge, brownish but not offensive, as well as frequency of micturition and dysuria. On examination of the patient, a cyst was found in the antero-lateral wall, about two inches inside the vagina. A small amount of brownish fluid could be expressed from the cyst. The cyst was removed, but was rather difficult to dissect out because of fibrous adhesions, and it was thought to be an infected Wolffian duct cyst. Convalescence was uneventful. The pathologist reported that the tissue supplied was friable and intermixed with blood clot. Examination of one of the slides prepared showed necrotic tissue in which nothing was recognizable. In the other was squamous epithelium, presumably vaginal, beneath which was chronic inflammation of a non-specific character. No malignant cells were seen. The patient was discharged from hospital on March 26, but was readmitted on April 2 because of vaginal bleeding. The bleeding, which was from an ulcerated area on the left vaginal wall, persisted, despite repeated packing of the vagina and ultimate ligation of both internal iliac vessels. Examination of biopsy material from the lesion on May 22 revealed only granulation tissue. The patient died on August 5.

At the post-mortem examination a tumour four inches long, three inches wide and one and a half inches thick was found in the left antero-lateral wall of the vagina, presenting a cauliflower-like fungating surface to the vaginal canal. It was limited to the vaginal wall, but had pushed the uterus upwards. The left ureter was also pushed upwards, and was dilated, as was the left renal pelvis. The pathologist supplied the following report on the microscopic appearance of the tumour:

Large areas of the growth in the vagina consisted of necrotic tissue and blood clot. In areas where the pattern had not been disturbed by haemorrhage the structure of the growth could be seen to consist of a network of interlacing processes. These processes consisted of a central capillary with a minimum of connective tissue covered by a layer of epithelial cells which was never more than one cell thick. The cells were small and cuboidal with a round or bluntly oval nucleus. The nucleus had a clearly defined margin with a small amount of granular chromatin and small dark nucleolus. The cytoplasm was never very abundant and frequently scanty, it had a moderately clearly defined boundary and tended to be basophilic. This description is of the average cell type and the malignant nature of the growth is shown by the wide variations from this norm—variations in size of cell, depth of

staining, prominence of nucleolus and amount of cytoplasm. Mitotic figures were frequent. The cells were frequently dislodged from the processes so as to be free in the spaces between them.

This type of growth is quite unlike any that could arise from the squamous mucosa of the vagina. The anatomical situation of the growth suggests the epithelial remains of Gartner's duct as a possible site of origin. A comparison of the modal cell type of this growth with the cells lining benign Gartner's cysts shows a similarity which supports this probability.

Lymph nodes: Sections were made of some dark, slightly enlarged, but soft lymph nodes on the wall of the pelvis. No cancer cells were seen in these, but there were large numbers of pigment-laden histiocytes present. Presumably these were carrying haemosiderin from the haemorrhage in the neighbourhood of the growth.

Carcinoma of the Vagina.

Dr. Murray, with DR. HAROLD HAM, showed a married woman patient, aged fifty years, who had been admitted to hospital in May, 1951. She had two children, now aged twenty-eight and twenty-five years respectively; she had had no miscarriages, serious illnesses or operations. The menopause had occurred in 1943. Two months before her admission to hospital she had had pain in the vagina during intercourse; that had been followed by a watery vaginal discharge which had since persisted. Since the performance of a vaginal examination by her own doctor, the discharge had been blood-stained. One week before her admission to hospital a profuse vaginal haemorrhage had occurred. Vaginal examination revealed a friable, hard, flat tumour occupying almost the whole of the posterior vaginal wall. A normal atrophic cervix could be seen; the uterus was small and anterior in position. Examination of a biopsy specimen from the tumour revealed a squamous carcinoma. Radium was inserted into the vagina in a rubber tube and left in for seven days, a total dose of 53 millicuries being given.

Carcinoma of the Cervix.

Dr. Murray and Dr. Ham showed a married woman, aged forty-seven years, who had been well until January, 1951, when she had sought medical advice because of severe haemorrhage occurring during a menstrual period. On examination of the patient, an ulcerating tumour involving the cervix and vaginal vault was found, and examination of a biopsy specimen revealed a squamous carcinoma. She was treated with radium to a total dosage of 8500 milligramme-hours, and six or seven weeks later bilateral pelvic lymphadenectomy (as described by Meigs) was performed. Convalescence was uneventful. Microscopic examination of the removed lymph nodes revealed carcinomatous deposits in the right internal iliac nodes.

DR. STUART B. STUDY presented a married woman, aged thirty-six years, who had been admitted to hospital in November, 1950, with a history of foul-smelling vaginal discharge for two years. On examination of the patient, a fungating tumour was found occupying the cervix and spreading onto the vaginal vault. Examination of a biopsy specimen revealed a squamous carcinoma. After radium treatment to a total dosage of 8000 milligramme-hours, bilateral pelvic lymphadenectomy was performed. Microscopic examination of the removed lymph nodes revealed no evidence of carcinoma. Convalescence was uneventful. Dr. Study said that at a recent follow-up examination the patient had been very well and there was no sign of a recurrence.

Albuminuria of Pregnancy due to Renal Calculus.

Dr. Study and DR. ALBAN GEE presented a married woman, aged forty-two years, who had been sent down from the country in July, 1950, when about four months pregnant, because albumin was persistently present in her urine. She had had three previous pregnancies. The first, in 1939, had ended with a stillbirth because of "twisted cord". In 1942 twins had been born; one twin, a male, survived, the other, a female, was stillborn. In 1949 a living child had been born; during the fifth month of pregnancy the patient had been treated with a salt-free diet for three weeks. She had been beriberi in 1945 while a prisoner of war in Java. While she was in hospital with her present illness, her blood pressure fluctuated between 106 millimetres of mercury, systolic, and 70 millimetres, diastolic, and 150 millimetres of mercury, systolic, and 90 millimetres, diastolic. There was no obvious physical abnormality. The urine contained pus cells, occasional red blood cells and epithelial cells, and was sterile on attempted culture. Specimens obtained by cystoscopy from both ureters contained many pus cells, but were sterile.

X-ray examination revealed a moderate-sized calculus in the left renal pelvis, with some hydronephrosis of the right kidney, which did not appear to be functioning well. In August, 1950, left pyelolithotomy was performed, and a stone one and a half inches in diameter was removed. Convalescence was uneventful, and in November a normal living female infant was born. The urine remained normal. In March, 1950, the patient was very well. An excretion pyelogram showed normal excretion on the left side and deficient excretion on the right. The blood pressure was 130 millimetres of mercury, systolic, and 80 millimetres, diastolic.

Stillbirth due to Detachment of Cord from Placenta.

DR. EDMUND COLLINS showed a married woman, aged thirty-three years, who, after a normal pregnancy, had come into labour at 6 a.m. on March 8, 1951, that being the expected date of confinement. At 1.30 a.m. on March 9 the fetal heart sounds suddenly disappeared. At 4.45 a.m. a stillborn female child weighing eight pounds was delivered naturally. The cord was wound twice round the neck and came away with the baby. When the placenta was delivered, a short stump of cord was found attached to it. At about the time when the fetal heart sounds disappeared, a show of bright blood from the vagina was noted. Dr. Collins said that the only sedation given during the labour had been 150 milligrammes of "Pethidine".

Herpes Gestationis.

DR. COLLINS with DR. F. C. FLORANCE showed a married woman, aged twenty-four years, who had attended the Royal North Shore Hospital of Sydney for her second confinement. A previous pregnancy in April, 1950, had been normal, and had resulted in the birth of a normal child. At about the twenty-fourth week of the present pregnancy the patient had developed herpes, which persisted throughout the remainder of the pregnancy. A living child had been born on April 7, 1951, delivery being normal. In the subsequent twelve weeks up to the time of the meeting exacerbation of the condition had persistently occurred, with fresh crops of lesions. The blisters had appeared mainly on the arms, trunk and thighs. At the time of the meeting the lesions appeared to be becoming fewer.

(To be continued.)

Dut of the Past.

In this column will be published from time to time extracts, taken from medical journals, newspapers, official and historical records, diaries and so on, dealing with events connected with the early medical history of Australia.

NOTE ON SMALLPOX.¹

[*Historical Records of Australia, Series I, Volume I, footnote to page 145.*]

Of all known epidemic diseases smallpox is the solitary infection of which the introduction to the continent of Australia is involved in obscurity. Prior to the foundation of the settlement at Port Jackson there is no evidence of the occurrence of epidemic diseases amongst the aborigines and such infections were probably non-existent at the foundation. Owing to the lengthy time occupied by vessels in transit from their last port of call in the early days of the colony, all diseases had sufficient times to develop, and consequently their introductions can be traced with the single exception of smallpox. When Phillip and the first settlers arrived, the aborigines were keenly observed and any peculiarities noted, such as loss of part of a finger or of a front tooth: but not one of the early observers recorded the observation of any natives possessing pock marks. Further the high mortality when the disease became prevalent points to the probability that the epidemic gained a foothold in virgin soil (c.f. the first epidemic of measles in Fiji). When the disease was prevalent, it was found that the natives called it gal-gal-la, but this cannot be taken as definite evidence of a previous knowledge of the disorder. It is further highly improbable that Surgeon White and his colleagues were mistaken in their diagnosis, for practitioners in England at that period had ample opportunity of becoming fully acquainted with the disease.

¹ From the original in the Mitchell Library, Sydney.

The observations of explorers and colonists in other parts of Australia at a later date record the existence or evidences of the previous occurrence of the disease, and in many cases the aborigines asserted that the infection had first come from the direction of Sydney.

It is therefore probable that smallpox was introduced in 1788. The disease assumed an epidemic character in April 1789 and did not die out until the year 1845.

The disease must have been carried in the vessels of the first fleet or in the ships of La Pérouse's expedition, although the occurrence of the disease on board of them is not recorded. The inhabitants of England and France at that period possessed a certain degree of acquired immunity owing to the epidemics which had devastated Europe in the seventeenth and eighteenth centuries: it is therefore highly probable that the person or persons who carried the disease possessed it in such a mild form that it passed unnoticed.

The type of the infection must also have been peculiar and attenuated in character, for it did not become virulent until fifteen months after the first Fleet and La Pérouse's vessels had arrived at the coast. Further, although probably 50 per cent. of the natives in the neighbourhood of Port Jackson perished, only one sailor, of North American origin, belonging to the Supply, was attacked in the first year, and probably not more than six persons acquired the infection from the aborigines during its subsequent course up to the year 1845.

Correspondence.

THE REGISTRATION AND CLASSIFICATION OF INFANT DEATHS AND FETAL DEATHS.

SIR: I should like to draw attention to attempts of the World Health Organization to improve the registration and classification of "still-births". A subcommittee, reporting to the Expert Committee on Health Statistics, has formulated a new terminology, which might be acceptable to all member States. The new definitions are given on page 174 of the *Chronicle of the World Health Organization*, Volume IV, Number 6, as follows:

Live birth is the complete expulsion or extracting from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live born.

Fœtal death is death prior to the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy: the death is indicated by the fact that after such separation, the fœtus does not breathe or show any other evidence of life such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles.

These definitions were approved by the Expert Committee on Health Statistics in April, 1950, at Geneva, and in May, 1950, by the Third Health Assembly at Geneva. A note (page 237 of the *Chronicle*, Volume IV) states that the adoption of the above definitions is especially important in that "birth statistics might, in future, be based on the new definitions of live birth and fœtal death which were set forth by the subcommittee and which might now be adopted by Member States. This should result in a notable improvement in the comparability of such statistics".

The subcommittee further recommended that the live births should be classified into four groups as follows (duration of gestation being measured from the beginning of the last menstruation):

- Group I: less than 20 complete weeks of gestation.
- Group II: 20 complete weeks of gestation, but less than 28.
- Group III: 28 complete weeks of gestation, or more.
- Group IV: gestation period not classifiable in groups I, II and III.

With requisite changes of detail, the same classification should be used in the preparation of tables of "fœtal deaths". Groups I, II and III may be described as "early", "intermediate", and "late" fœtal deaths. The terms "abortion" and "stillbirth" should be retained only if essential for use within a nation, and "stillbirth" only

as it corresponds to group III (late fetal deaths). The subcommittee did not attempt to define "abortion". (*Chronicle*, Volume IV, page 175.)

The chief change is that respiration is not considered essential to the diagnosis of a live birth. The subcommittee recommended that only a "fetal death certificate" be made out for a fetal death and not both a birth and a death certificate be required for such cases.

It must be noted that the subcommittee gives no support to any proposal to exclude any premature births on the ground that the fetus is "pre-viable" or "non-viable".

It is important that Australian statistical practice remain consistent with the expert subcommittee's recommendations, in order that our statistics may be comparable with other countries.

It is further stated on page 176 of the *Chronicle* that an expert group on prematurity stressed the importance of giving especial care to all infants weighing five and a half pounds or less, regardless of the gestation period. Although they point out that the birth weight may not always be available, yet in Australia there must be few cases where the infant is not weighed. Weight seems to be the simplest and most economical method of classification of infants and stillbirths. In the new "Manual of the International Statistical Classification of Diseases, Injuries and Causes of Death", the following rather unsatisfactory definition is given:

For the purposes of this classification an immature infant is a liveborn infant with a birth weight of 5½ pounds (2,500 grams) or less, or specified as immature. In some countries, however, this criterion will not be applicable. If weight is not specified, a liveborn infant with a period of gestation of less than 37 weeks or specified as "premature" may be considered as the equivalent of an immature infant for the purposes of this classification.

In the classification of the deaths from causes peculiar to early infancy, there is provision for the classification by maturity as well as by cause. It appears desirable that the birth and death certificates should be designed to give this information. Since birth weight is the most practicable evidence of age or length of gestation, there should be some method of incorporating this into the certificate or of collecting the information for every birth and infant death. Since in Australia the great majority of births occur in hospitals, this information could be collected by the health department of the State. It is necessary to have this information collected for every birth, or otherwise no rate of mortality by birth weight could be computed. Registration practice should also be modified throughout Australia to enable data to be collected on the birth order of the child, the plurality of the birth, disease of the mother or difficulty in labour.

Yours, etc.,

H. O. LANCASTER,
Lecturer in Vital Statistics.
The School of Public Health and Tropical Medicine,
Sydney,
August 22, 1951.

ACCIDENTAL PREFRONTAL LEUCOTOMY.

SIR: Your annotation on accidental prefrontal leucotomy, which appeared on page 303 of your issue of September 1, 1951, found me a very interested reader, especially as Dr. R. A. Money, of Sydney, and I had published a similar case as early as 1943. I refer to the article in *The Australian and New Zealand Journal of Surgery*, Volume XIII, Number 2, page 82, 1943: "Air in the Cranial Cavity: A Critical Review, with Reference to an Unusual Case." A description is given of a corporal who attempted suicide with a service rifle and received a wound of the left infratemporal and frontal regions. He subsequently developed pneumocephalus and secondary infection, which responded to surgical operation and chemotherapy. The first three paragraphs of the discussion may interest your readers further to the subject of the annotation.

1. The primary recovery of the patient was remarkable considering the severity and extent of the initial trauma, which necessitated evisceration of the left eye. The early appearance of a euphoric state and a relative insensibility to pain, associated with cortical destruction in the frontal areas, may have helped considerably. This lack of emotional response was evident and assisted his rapid recovery after the operation and during the subsequent attack of pneumococcal meningitis.

2. The damage to the frontal lobes, caused by the bullet, is regarded as an important factor in eliminating his suicidal tendencies and worries, which never recurred after the trauma. This fact may be taken as human experimental evidence of the value of prefrontal lobotomy or lobectomy, recently advocated by some writers for the relief of certain mental disorders.

3. The minor degree of cognitive defect, as compared with the amount of affective disorder, despite the traumatic destruction of the left frontal lobe and its subsequent disruption and distension with air, corroborates observations made elsewhere that serious mental deterioration need not necessarily result from operations for removal of the frontal lobes.

Yours, etc.,

ALAN STOLLER,
Consultant (Psychological Medicine),
Repatriation Commission Headquarters.

St. Kilda Road,
Melbourne, S.C.1.
September 6, 1951.

Obituary.

STANLEY GEORGE BRADFIELD.

We are indebted to Dr. S. Livingstone Spencer for the following appreciation of the late Dr. Stanley George Bradfield.

Stanley George Bradfield was killed in an accident on August 12, 1951. He had taken a tree-felling expert to his holiday property at Stanwell Park in order to dispose of a tree which endangered a neighbour's home. A rope which was being used fouled a second tree, and then whipped with tremendous force against Bradfield's chest, breaking his ribs and causing intrathoracic injuries which were immediately fatal.

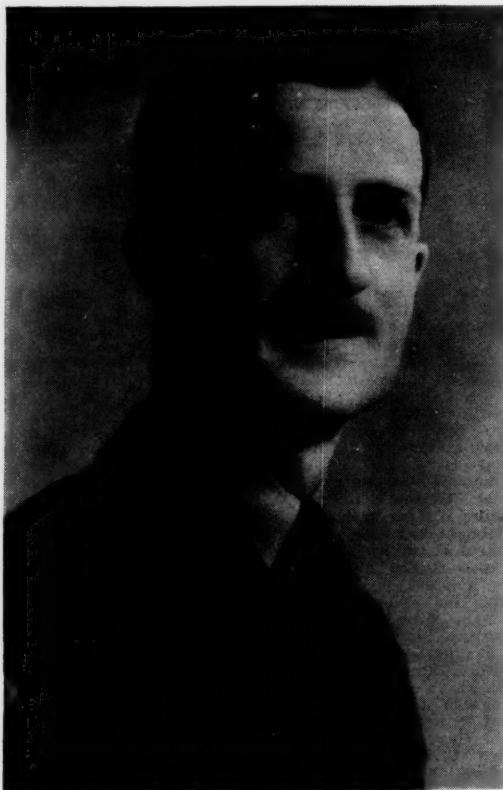
Stan Bradfield was born at Gordon in New South Wales in 1906, and came of a distinguished family. His father was the late Dr. J. J. C. Bradfield, for many years chief engineer for metropolitan railway construction, and designer of the Sydney Harbour bridge. His mother, sister and four brothers survived him, including Dr. E. V. Bradfield, formerly of Belmont and now practising at Arncliffe, Sydney. He was educated at the Sydney Church of England Grammar School, and passed the leaving certificate examination with first class honours in mathematics and physics, going on to receive his undergraduate education at the University of Sydney. Always near the top of his year, he won the Parkinson Memorial Prize for pathology and bacteriology, and graduated in 1930 with first class honours. During the last three years of his medical course he was a member of Saint Paul's College.

He was appointed to the resident medical staff of the Royal Prince Alfred Hospital, and after terms in residence at the Royal South Sydney Hospital, the Women's Hospital, Crown Street, and the Royal Alexandra Hospital for Children, he went abroad for post-graduate study, and remained in England from 1933 to 1935, gaining further experience as resident medical officer at the Stockton and Thornaby District Hospital, and at the Hampstead Children's Hospital. During this period, also, he passed the examination for membership of the Royal College of Physicians, London. Later, in 1938, he became a foundation member of The Royal Australasian College of Physicians.

On his return to Sydney in 1935, Bradfield commenced in general practice at Bankstown, a suburb of Sydney, in succession to the late Dr. E. M. Goard. Here, by his ability, his boundless energy and his conscientious devotion to his calling, he attracted a wide circle of patients, who were also his friends. Always a lover of children, he gave more and more attention to paediatrics, and in 1950 he entirely relinquished the care of his adult patients to Dr. Colin Ratcliff and from then on restricted his practice to the treatment of sick children, whom he saw at Bankstown and in his rooms in Macquarie Street, Sydney. He had been a member of the honorary medical staff of the Royal Alexandra Hospital for Children since 1936, and an honorary physician since 1949. He had also served the hospital for two years as secretary to the honorary medical staff, and had been a tutor in paediatrics in the University of Sydney. In 1949, when the Government of New South Wales set up a panel of consultants who might be called to examine patients suspected of having anterior poliomyelitis, Bradfield was one of the two nominees of the Royal Alexandra Hospital for Children. He attended the Australasian Medical

Congress (British Medical Association) in Brisbane in 1950, and the inaugural meeting of the Paediatric Association of Australia, of which he was a foundation member. On several occasions he lectured on child health for the Post-Graduate Committee in Medicine in the University of Sydney. In 1941 Bradfield went overseas with the 2/12 Australian General Hospital, and soon rose to the rank of major, returning to practice in 1944.

In 1935 Stan Bradfield married Miss Enid Alt, also of Gordon. Only a few months before his untimely death he had acquired a beautiful home in this suburb, and was looking forward to the full indulgence of one of his keenest interests, that of gardening. His love of the open air was an expression of his unflagging energy, and his close friends will remember the slender tireless figure which tramped



briskly ahead through the bush when his companions would willingly have rested or turned back. The operas of Gilbert and Sullivan formed another interest. Bradfield knew many of their songs by heart, and every Gilbert and Sullivan season saw him prominent in the audience.

Always a devoted husband and father, Stan Bradfield leaves his widow and four young children, two daughters and two sons. He is also mourned by countless patients and friends, who knew him as a fine physician and a staunch comrade. The memory of Stan Bradfield's sincerity and generosity will live on in the hearts of those who knew him, together with universal sorrow that he should have been taken from us when he stood on the threshold of a great career.

Dr. Lennox Price writes: Stanley Bradfield's brilliant academic record and his skill as a physician were known to many, but it is of his more personal qualities that I wish to write. Our two families being linked in friendship, it naturally followed, on our return from active service, that our children should be growing up together, and that we should associate more closely. Here it was, within the family circle, that one saw him in his happiest moments, for he loved all children, and in his devotion to his own he was, I believe, the ideal parent. Firm when necessary, but always kindly and never patronizing, he seemed naturally to draw children to him; and it was surely fitting that

paediatrics should be his chosen specialty. It became necessary to seek his help in the case of one of my own children, and I was thus able to appraise at first hand the careful history-taking and meticulous physical examination, followed by the necessary advice, all accomplished quietly and without fuss or frill. He possessed no artificial airs and graces, nor did he seem to encourage those who adopted them. The somewhat clipped form of speech gave a first impression of an abrupt manner, but this was mollified by a bubbling sense of humour, which would burst forth at unexpected moments, and one learnt to appreciate the sudden quip, followed by the merry twinkle of the eye which was his characteristic.

Of small stature, he yet possessed an inexhaustible fund of physical and mental energy, and was never idle for a moment. Up with the lark, he would be off on an early morning consultation long before the normal breakfast hour, or when time permitted he might be found energetically tilling his kitchen garden in which he took a pride. Work or the welfare of his patients was his chief concern; but his great delight was to take a brief respite with his children at his holiday retreat at Stanwell Park. Tragically it was in this manner that he met his death, for while he was felling a tree, no doubt in preparation for summer camps, the fatal accident occurred. Death, we are told, was instantaneous.

Our sympathy goes out to his widow and the four young children whom he left, the eldest a girl aged twelve years and the youngest a baby boy a little over one year old.

Medicine in this generation could ill afford to lose such a man as Stan Bradfield.

KARL FERDINAND CHRISTIAN BRUNNICH.

We regret to announce the death of Dr. Karl Ferdinand Christian Brunnich, which occurred on September 12, 1951, at Brisbane, Queensland.

Australasian Medical Publishing Company, Limited.

ANNUAL MEETING.

THE annual meeting of the Australasian Medical Publishing Company, Limited, was held at The Printing House, Seamer Street, Glebe, New South Wales, on September 10, 1951, Sir Henry Newland, the Chairman, in the chair.

Directors' Report.

The report of the directors of the company was as follows.

The directors submit their report for the twelve months ended June 30, 1951, together with the balance sheet as at June 30, 1951, and the profit and loss account for the twelve months ended June 30, 1951.

It is with regret that we report the death in Adelaide on May 9, 1951, of Dr. Frank Sandland Hone, who had been a member of the company from May, 1913, to November, 1950, and a director from July, 1915, to February, 1924.

The Commonwealth Jubilee Number of *THE MEDICAL JOURNAL OF AUSTRALIA* was published on January 6, 1951. A specially bound copy was graciously accepted by His Majesty the King. Many congratulatory messages were received from readers in Australia and overseas.

The result of the year's production in the printing and publishing department was satisfactory. Difficulties associated with the failures in the supply of electricity were overcome by the installation of a diesel-driven alternator, but the company continues to be faced with a shortage of paper and rising costs.

The company's reserves are used in the business and we consider that the state of the company's affairs is satisfactory.

Provision has been made for the payment of debenture interest for the year ended June 30, 1951.

Dr. W. L. Calov and Dr. J. P. Major retire from office by rotation in accordance with the Articles of Association (Article 39). They are eligible and present themselves for reelection.

H. S. NEWLAND.
Chairman.

August 2, 1951.

Election of Directors.

Dr. W. L. Calov and Dr. J. P. Major were reelected to the Board of Directors.

Post-Graduate Work.

THE POST-GRADUATE COMMITTEE IN MEDICINE IN THE UNIVERSITY OF SYDNEY.

Week-End Courses at Wollongong.

THE Post-Graduate Committee in Medicine in the University of Sydney, in conjunction with the Clinical Society of the South-Eastern Medical Association, announces that week-end courses will be held at the Wollongong District Hospital. In response to local request, this programme is to be held on the first Sunday afternoons of October, November and December, 1951.

Sunday, October 7, 1951: 2 p.m., "Some Paediatric Cases", Dr. R. A. R. Green. 3.15 p.m., "Chronic Ulceration of the Legs", Dr. J. Loewenthal.

Sunday, November 4, 1951: 2 p.m., "Scope and Possibilities of Cortisone Therapy", Dr. T. M. Greenaway. 3.15 p.m., "Some Recent Surgical Advances of Interest to the Practitioner", Dr. F. F. Rundle.

Sunday, December 2, 1951: 2 p.m., "Recognition and Management of Renal Failure", Dr. J. Kempson Maddox. 3.15 p.m., "The Tonsil Problem", Dr. A. E. Khan.

The fee for the course will be £2 2s. Those wishing to attend are requested to notify Dr. Rawdon T. Suttor, Honorary Secretary, Clinical Society of the South-Eastern Medical Association, 60 Kembla Street, Wollongong, as soon as possible.

Clinical Meeting at Balmoral Naval Hospital.

The Post-Graduate Committee in Medicine in the University of Sydney announces that a clinical meeting will be held at the Balmoral Naval Hospital on Tuesday, October 9, 1951, at 2 p.m. Dr. John Loewenthal will speak on the "Surgery of Diseases of the Peripheral Vascular System". Clinical cases will be presented at 4 p.m. All members of the medical profession are cordially invited to attend.

THE SYDNEY INSTITUTE FOR PSYCHO-ANALYSIS.

THE Sydney Institute for Psycho-Analysis announces a course of free introductory lectures for psychiatrists and other medical graduates, the seminars to be held fortnightly from 7 p.m. to 9 p.m. Those who wish to attend will be notified of the date of the first seminar if they write to the secretary of the institute at 143 Macquarie Street, Sydney, stating the day of the week preferred.

Naval, Military and Air Force.

APPOINTMENTS.

THE undermentioned appointments, changes *et cetera* have been promulgated in the *Commonwealth of Australia Gazette*, Number 68, of November 13, 1951.

AUSTRALIAN MILITARY FORCES.

Royal Australian Army Medical Corps.

To be Captain (Temporary Major), 2nd August, 1951.—NX700304 Ronald Cuttle.

To be Captain, 26th June, 1951.—3/40054 James Heaton Cater.

To be Captain, 26th June, 1951 (with Short Service Commission for a period of four years).—3/40054 James Heaton Cater (Captain).

Citizen Military Forces.

Southern Command: Third Military District.

Royal Australian Army Medical Corps (Medical): To be Captain (provisionally), 4th July, 1951.—3/101814 John Martin Bradley.

DISEASES NOTIFIED IN EACH STATE AND TERRITORY OF AUSTRALIA FOR THE WEEK ENDED SEPTEMBER 1, 1951.¹

Disease.	New South Wales.	Victoria.	Queensland.	South Australia.	Western Australia.	Tasmania.	Northern Territory. ²	Australian Capital Territory.	Australia. ³
Ankylostomiasis	•	•	•	•	•	•	•	•	•
Anthrax	•	•	•	•	•	•	•	•	•
Beriberi	•	•	•	•	•	•	•	•	•
Bilharziasis	•	•	•	•	•	•	•	•	8
Cerebro-spinal Meningitis	•	7(5)	1(1)	•	•	•	•	•	•
Cholera	•	•	•	•	•	•	•	•	•
Coastal Fever ^(a)	•	•	•	•	•	•	•	•	•
Dengue	•	•	•	•	•	•	•	•	2
Diarrhoea (Infantile)	•	2	1	4(4)	6(5)	•	•	•	14
Diphtheria	1(1)	2	1	4(4)	6(5)	•	•	•	5
Dysentery (Amoebic)	•	•	5(5)	•	•	•	•	•	1
Dysentery (Bacillary)	•	•	•	•	•	•	•	•	•
Encephalitis Lethargica	•	•	•	1(1)	•	•	•	•	•
Erysipelas	•	•	•	•	•	•	•	•	•
Filariasis	•	•	•	•	•	•	•	•	•
Helminthiasis	•	•	•	•	•	•	•	•	•
Hydatid	•	•	•	•	•	•	•	•	•
Influenza	•	•	•	•	•	•	•	•	•
Lead Poisoning	•	•	•	•	•	•	•	•	•
Leprosy	•	•	•	•	1	•	•	•	1
Malaria ^(b)	•	•	•	•	•	•	•	•	109
Measles	•	•	•	109(77)	•	•	•	•	73
Plague	•	•	•	•	•	•	•	•	3
Poliomyelitis	22(9)	18(4)	10(5)	20(16)	3(2)	•	•	•	56
Psaltacosis	•	•	•	•	•	•	•	•	8
Puerperal Fever	1(1)	•	2	•	2(1)	•	•	•	1
Ebulla ^(c)	•	5(5)	1	8(3)	2(2)	2(1)	•	•	107
Scarlet Fever	24(16)	14(9)	6(1)	8(3)	1(1)	•	•	•	1
Smallpox	•	•	•	•	•	•	•	•	•
Tetanus	•	•	•	•	•	•	•	•	•
Trachoma	•	•	•	•	•	•	•	•	•
Tuberculosis ^(d)	44(38)	20(15)	16(12)	13(10)	13(10)	1(1)	•	•	1
Typhid Fever ^(e)	•	•	1	•	1(1)	•	•	•	•
Typhus (Endemic) ^(f)	•	•	•	•	•	•	•	•	•
Urticant Fever	•	•	1	•	•	•	•	•	1
Well's Disease ^(g)	•	•	•	•	•	•	•	•	•
Whooping Cough	•	•	•	•	•	•	•	•	•
Yellow Fever	•	•	•	•	•	•	•	•	•

¹ The form of this table is taken from the *Official Year Book of the Commonwealth of Australia*, Number 37 1946-1947. Figures in parentheses are those for the metropolitan area.

² Figures not available.

³ Figures incomplete owing to absence of returns from the Northern Territory.

^c Not notifiable.

^(a) Includes Mossman and Sarina fevers. ^(b) Mainly relapses among servicemen infected overseas. ^(c) Notifiable disease in Queensland in females aged over fourteen years. ^(d) Includes all forms. ^(e) Includes enteric fever, paratyphoid fevers and other *Salmonella* infections. ^(f) Includes scrub, murine and tick typhus. ^(g) Includes leptospirosis, Well's and para-Well's disease.

Western Command: Fifth Military District.
Royal Australian Army Medical Corps (Medical): To be Captain (provisionally), 20th July, 1951.—5/26486 Maurice Daniel McCallum.

Reserve Citizen Military Forces.

Royal Australian Army Medical Corps.

1st Military District.—To be Honorary Colonel, 19th July, 1951: Lieutenant-Colonel P. W. Hopkins, M.C. To be Honorary Lieutenant-Colonels, 19th July, 1951: Majors H. W. Anderson, B. L. W. Clarke, P. H. Macindoe, A. D. A. Mayes, G. A. McLean, G. C. H. Hogg, O. E. Nothling and T. V. Stubbs-Brown, and Captain (Honorary Major) F. W. R. Lukin. To be Honorary Majors, 19th July, 1951: Captains L. P. Sapsford, C. N. Sinnamon and C. R. Boyce. To be Honorary Captains, 20th July, 1951: Ian Lewis Chapple and Ernest Humphry Cramond.

2nd Military District.—To be Honorary Lieutenant-Colonels, 19th July, 1951: Majors G. C. Halliday, E. A. Hedberg, E. Murray-Will, M.B.E., and S. J. M. Goulston, M.C.

3rd Military District.—To be Honorary Captains, 19th July, 1951: Ann Beatrice Bridge and Merlyn Joy McCulloch.

5th Military District.—To be Honorary Lieutenant-Colonels, 19th July, 1951: Majors B. A. Hunt, M.B.E., B. W. Nairne, M.B.E., and Captains (Honorary Majors) R. D. M. Hall and J. P. Ainslie. To be Honorary Majors, 19th July, 1951: Captains M. G. F. Donnan and E. J. Green.

6th Military District.—To be Honorary Major, 19th July, 1951: Captain D. H. Waterworth. To be Captain, 9th July, 1951: Mieczyslaw George Ciezar.

7th Military District.—To be Honorary Lieutenant-Colonel, 19th July, 1951: Major M. Sendak, O.B.E.

The following officers are placed upon the Retired List within Military Districts on the dates shown with honorary rank as indicated, and with permission to wear the prescribed uniform:

1st Military District.—To be Honorary Colonel: Lieutenant-Colonel O. E. J. Murphy, 14th August, 1951.

2nd Military District.—Lieutenant J. V. Keller (née Turton), 17th August, 1951.

3rd Military District.—Lieutenant-Colonel (Honorary Colonel) D. J. Thomas, Lieutenant-Colonel A. E. Coates, O.B.E., Major (Honorary Lieutenant-Colonel) P. MacCallum, M.C., Majors N. R. Dale, W. J. L. Duncan, S. E. Francis and L. K. Gordon, Captains W. G. G. Sinclair and C. E. V. Sutherland, and Honorary Captain B. Gretton-Watson, 1st July, 1951.

4th Military District.—Lieutenant-Colonel (Honorary Colonel) A. R. Southwood, C.M.G., E.D., Lieutenant-Colonels N. S. Gunning and L. C. E. Lindon, Majors C. Gurner, F. J. B. Miller, H. K. Pavay and B. H. Swift, M.C., Captains (Honorary Majors) H. M. Birch, G. A. Lendon and P. S. Messent, Captains R. C. Bassett, S. R. Hecker and D. R. Wallman, Honorary Captains P. J. Alpers, K. W. Bollen, H. E. Dunstone, R. H. Morgan, W. A. Pryor, C. Richards, W. H. Russell, A. Sandison, D. M. Steele and S. M. Verco, 10th August, 1951.

ROYAL AUSTRALIAN AIR FORCE.

Permanent Air Force: Medical Branch.

Charles Richard Thomas (024424) is appointed to a short-service commission, on probation for a period of twelve months, 16th July, 1951, with the rank of Flying Officer.

The probationary appointment of the following Flight Lieutenants is confirmed: E. C. Hey (023024), P. M. Davies (023028).

The date appearing in the notification regarding Flight Lieutenant B. Capper (023023) as approved in Executive Council Minute No. 38 of 1951, appearing in *Gazette* No. 50, dated 12th July, 1951, is amended to read 7th June, 1951.

Nominations and Elections.

The undermentioned has applied for election as a member of the New South Wales Branch of the British Medical Association:

Drummond, John McPherson, M.B., B.S., 1951 (Univ. Sydney), 21 Alexandra Street, Hunters Hill.

Notice.

AN EXHIBITION OF BOOKS.

EARLY MEDICAL WORKS (mainly anatomical) from the sixteenth, seventeenth and eighteenth centuries will be displayed in the upper part of the Wilson Museum in the Department of Anatomy of the University of Sydney from October 8 to 31, 1951, from 10 o'clock a.m. to 4.30 o'clock p.m. on week days only. All students and graduates will be welcomed.

Diary for the Month.

OCT. 2.—New South Wales Branch, B.M.A.: Council Quarterly.
 OCT. 3.—Western Australian Branch, B.M.A.: Council Meeting.
 OCT. 3.—Victorian Branch, B.M.A.: Branch Meeting.
 OCT. 4.—South Australian Branch, B.M.A.: Council Meeting.
 OCT. 5.—Queensland Branch, B.M.A.: Branch Meeting.
 OCT. 5.—Tasmanian Branch, B.M.A.: Council Meeting.
 OCT. 9.—New South Wales Branch, B.M.A.: Executive and Finance Committee.

Medical Appointments: Important Notice.

MEDICAL PRACTITIONERS are requested not to apply for any appointment mentioned below without having first communicated with the Honorary Secretary of the Branch concerned, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

New South Wales Branch (Medical Secretary, 135 Macquarie Street, Sydney): All contract practice appointments in New South Wales.

Victorian Branch (Honorary Secretary, Medical Society Hall, East Melbourne): Associated Medical Services Limited; all Institutes or Medical Dispensaries; Australian Prudential Association, Proprietary, Limited; Federal Mutual Medical Benefit Society; Mutual National Provident Club; National Provident Association; Hospital or other appointments outside Victoria.

Queensland Branch (Honorary Secretary, B.M.A. House, 225 Wickham Terrace, Brisbane, B17): Brisbane Associated Friendly Societies' Medical Institute; Bundaberg Medical Institute. Members accepting LODGE appointments and those desiring to accept appointments to any COUNTRY HOSPITAL or position outside Australia are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.

South Australian Branch (Honorary Secretary, 178 North Terrace, Adelaide): All Lodge appointments in South Australia; all Contract Practice appointments in South Australia.

Western Australian Branch (Honorary Secretary, 205 Saint George's Terrace, Perth): Norseman Hospital; all Contract Practice appointments in Western Australia. All government appointments with the exception of those of the Department of Public Health.

Editorial Notices.

MANUSCRIPTS forwarded to the office of this journal cannot under any circumstances be returned. Original articles forwarded for publication are understood to be offered to THE MEDICAL JOURNAL OF AUSTRALIA alone, unless the contrary be stated.

All communications should be addressed to the Editor, THE MEDICAL JOURNAL OF AUSTRALIA, The Printing House, Seamer Street, Glebe, New South Wales. (Telephones: MW 2651-2.)

Members and subscribers are requested to notify the Manager, THE MEDICAL JOURNAL OF AUSTRALIA, Seamer Street, Glebe, New South Wales, without delay, of any irregularity in the delivery of this journal. The management cannot accept any responsibility or recognize any claim arising out of non-receipt of journals unless such notification is received within one month.

SUBSCRIPTION RATES.—Medical students and others not receiving THE MEDICAL JOURNAL OF AUSTRALIA in virtue of membership of the Branches of the British Medical Association in the Commonwealth can become subscribers to the journal by applying to the Manager or through the usual agents and book-sellers. Subscriptions can commence at the beginning of any quarter and are renewable on December 31. The rate is £4 per annum within Australia and the British Commonwealth of Nations, and £5 per annum within America and foreign countries, payable in advance.